1986

ANNUAL REPORT

ANIMAL HEALTH DIVISION

Alberta
AGRICULTURE

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ANIMAL HEALTH DIVISION

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Programs and services were offered by the Animal Health Division to assist the agricultural industry in reducing losses due to disease; to provide management systems for disease prevention; to help prevent the spread of infectious disease; to assist in the production of safe quality food; and to enforce the legislation assigned to the Division. In addition, the Division was responsible for the diagnosis and control of wildlife diseases, assisting with laboratory animal research and disease diagnosis, and assisting in those public health situations related to the spread of diseases from animals to man.

The Division was responsible for administration of the Livestock Diseases Act, the Meat Inspection Act, the Fur Farms Act, the Animal Protection Act, and the Veterinary Profession Act. Efforts to update the regulations under these Acts were continued. The Livestock Medicine Regulations were amended and the new regulations under the Veterinary Profession Act were proclaimed.

Grants were again provided to the Alberta Society for the Prevention of Cruelty to Animals to enable them to employ special constables to investigate problems associated with cruelty, neglect and distress in animals. Six special constables located throughout Alberta provided the main enforcement mechanism for the Animal Protection Act. A grant to provide core operating funds for the Veterinary Infectious Diseases Organization (VIDO) was continued.

The Summer Veterinary Work Experience Program provided employment for 29 veterinary students at a cost of $51,100. The program was well received by both students and veterinary practitioners.

In 1986, rabies in skunks reached epidemic proportions in Saskatchewan and continued its spread towards Alberta. Efforts were increased to control skunks along the border and to depopulate them in areas surrounding the location of positive cases in Alberta. There was one positive skunk and five positive bats reported.

A severe snowstorm in May, resulted in considerable losses of newborn calves and recently calved cows. There were increased reports of hypocalcemia and hypomagnesemia in beef cows in the southern portion of the province.

Leptospirosis continued to be a concern to some cattle and swine producers. Division veterinarians spent a significant amount of time dealing with requests from veterinarians and livestock owners for information regarding leptospirosis and investigations of problems. Demands for serological testing for leptospirosis increased greatly and the Agriculture Canada laboratory at Lethbridge experienced difficulty in meeting the increased demands.

Equine viral arthritis (EVA) was diagnosed in the province for the first time during the year. Division staff spent many hours consulting with horse owners regarding this disease. Arrangements were made with a private laboratory to perform serological testing for horse owners and veterinarians.

Closer surveillance of young calves sold at auction markets was arranged following increased reports of salmonellosis in livestock. Several outbreaks of salmonellosis in dairy and beef cattle herds were investigated. The transportation of baby dairy calves from British Columbia for veal raising has been identified as a major source of salmonellosis in Alberta.

PATHOLOGY BRANCH

The Pathology Branch provides a laboratory disease diagnostic service in support of the veterinary profession and livestock owners. The services provided through the Pathology Branch enhance the disease diagnostic capacity of veterinary practitioners and thereby animal production. The service provided also is available to scientific institutions, other government agencies, fish and wildlife bodies, zoos and other classes of animal owners. Emphasis is upon the prevention of losses in both production and animals by the rapid and accurate diagnosis of diseases and management related conditions.

Submissions to the Pathology Branch remained at 1985 levels throughout the year of 1986. There was no significant change in submissions in any of the various categories. Services which were provided to other institutions such as other government agencies and the universities similarly remained at a stable level. Extension activities included AGRI-NEWS, AGRI-FACTS, scientific publications and presentations made by branch personnel to scientific and producer groups.

The results of laboratory examinations were reported to private veterinary practitioners in over 90% of domestic

animal submissions. This was considered to enhance the depth of professional services that were available to the livestock industry at the local level. It also served to amplify the dissemination of disease diagnostic and epidemiologic information gathered through the laboratory system.

An important undertaking of the Pathology Branch during 1986 was an investigation into fibrinous pneumonias in feedlots undertaken in conjunction with the Regional Laboratories Branch.

The Reproduction Section became increasingly involved in determining the importance of Leptospirosis infection in cattle and swine. The clinical and economic significance of Leptospirosis is proving very difficult to establish. There are a number of reasons for this including difficulties with various diagnostic tests, uncertainties regarding the background presence of the disease and subtleties of the clinical presentation.

The Poultry Section has correlated a significant increase in coliform septicemia in both turkeys and chickens with the removal of chloramphenicol from use in food producing animals. In some cases, as a result of the highly resistant nature of some of the avian pathogenic strains of E. coli, chloramphenicol has been the only effective antibiotic for this situation. The removal of this antibiotic from use has

therefore resulted in some increased production losses in the poultry industry.

The Pathology Branch continued its development of a livestock disease database for the province and expanded this to prepare the way for a North American animal disease database by adopting the SNOVET terminology system.

REFERENCE LABORATORIES BRANCH

The Reference Laboratories' principle responsibility was to provide technical laboratory services and expertise in microbiology, histology and toxicology. The laboratory, located in the O. S. Longman Building, Edmonton, provided laboratory services for veterinary pathologists working in the diagnostic pathology laboratories, other Animal Health Division veterinarians functioning as field investigators, epidemiologists and herd health specialists and private veterinary practitioners. It also acted as a central reference laboratory to the other regional provincial laboratories by providing sophisticated expertise such as viral isolation, special microbiology, chemical analysis and electron microscopy.

The Branch objectives were: to deliver a regional and a province-wide diagnostic laboratory support service; to provide laboratory support services necessary for monitoring important animal diseases in livestock populations; to provide consultation in specialized areas; and to conduct or participate in applied research projects. The laboratory provided appropriate technical workshops as part of a continuing education to the various Division scientists and veterinarians and veterinary practitioners. It also provided a federally accredited fish health laboratory service.

The Reference Laboratories Branch was divided into four sections. These are:

Histology & Electron Microscopy Section

This section was responsible for preparation of slides for light microscopy and offered a complete service of all special staining techniques to assist with the diagnosis of disease. In addition, an electron microscopy capability was provided.

Bacteriology Section

The bacteriology section was capable of identifying most of the bacterial pathogens found in the animal kingdom. It provided both aerobic and anaerobic bacterial cultures and Mycoplasma culture methodology and identification. These services are essential to identify the etiological agents which cause diseases.

Virology Section

The virology section provided isolation and identification of viral agents by maintaining and growing viruses on a variety of tissue cultures. Organisms such as Chlamydia and other viruses can be identified by egg inoculation. Serology was a major function within virology and many tests for various diseases of food-producing animals were performed utilizing most of the modern techniques of enzyme linked immunosorbent assay (ELISA), fluorescent antibody test (FAT), complement fixation, etc. Fish microbiological services was also provied by this section.

Toxicology Section

Inorganic and organic chemical analyses to determine toxic substances in animal tissues and other specimens using a broad array of advanced analytic instrumentation were conducted by the toxicology section. A major portion of work in this area is nutritive testing in which analysis for trace minerals and vitamins were provided. Environmental contaminants that will impinge upon animal health were identified in the laboratory. A major activity of the toxicology laboratory was the chemical analysis of water to evaluate water supplies for the agriculture community.

VIROLOGY-SEROLOGY SECTION

PROTOCOL IMPROVEMENT:

Agent Identification

Diagnosis of chlamydial infections improved considerably by the introduction of immunofluorescence and by the more efficient use of light microscopy of Macchiavello stained preparations to detect elementary bodies. Correlation between isolation of Chlamydia and results of immunofluorescence was found to be excellent.

Immunofluorescence was introduced for the diagnosis of various mammalian and avian viral agents as well. Most importantly, bovine virus diarrhea (BVD) infections were detected by this method using frozen sections of mesenteric lymph nodes. Bovine respiratory syncytial virus (BRSV), parainfluenza virus (PI_3), infectious laryngotracheitis (ILT) and infectious bronchitis virus (IBV) viral infections were diagnosed for the first time in this laboratory by the application of immunofluorescence on frozen sections.

The benefits of immunofluorescence as a diagnostic tool for the above agents was the rapidity with which reliable reports are sent out to practitioners, pathologists and producers. As opposed to virus isolation, immunofluorescence produces results in 24-48 hours.

Serology

Mycoplasma and transmissible gastroenteritis (TGE) serology was improved. Better quality control was introduced and confidence was established in these serological techniques. Specificity of infectious bursal disease (IBD) serology was increased. Serum neutralization tests for equine arteritis viral antibodies was introduced.

Diagnosis

BRS, BVD, PI_3, TGE, Chlamydia, IBR, parvo, bovine corona and rota, IB, reo, TE, ILT, Pacheco's disease, pox viral infections were diagnosed by either isolation of the agent or by immunofluorescence and/or electron microscopy performed directly on the specimen. Equine arteritis viral infection was diagnosed by the isolation of the etiologic agent from clinical cases for the first time in Canada. Serologic diagnosis of this disease was also successful. Chlamydia was isolated (also for the first time in this laboratory) from an ovine submission. Western equine encephalomyelitis (WEE) seroconversion was observed in one animal.

SURVEYS

Serological surveys were conducted in co-operation with pathologists, members of the Health Management Branch or directly with practitioners to establish health status of herds for BVD, IBR, BRSV, TGE, IBD, IBR and bovine leukosis viruses. Serologic results were used to make decisions concerning health management, such as vaccinations, eradications, etc.

Mosquito populations collected from various parts of Alberta were monitored for WEE carrier status. The agent of WEE was not isolated from the submitted mosquitoes.

Haemophilus (Actinobacillus) pleuropneumoniae serologic survey was conducted on a positive and on a negative swine herd. Evaluation of the ELISA results was done by statistical methods and the results will be published. The ELISA kit was prepared by Dr. Willson of VIDO and the serums were collected by Dr. Schipper of the Health Management Branch, who also did the statistical analysis of data.

Histology and Electron Microscopy Section

Dr. Dale Armstrong completed the qualifying board examinations for the American College of Veterinary Pathologists to become a Diplomate, ACVP. This is a widely respected recognition of knowledge of pathology and will complement the section's functions in histology and electron microscopy.

Gary Higgs was successfully recruited from the University of Alberta for the E.M. Lab Scientist II position. Gary has a wealth of transmission and scanning E.M. experience and will be an asset to our organization. He replaces Dr. Frances Leggett, who has joined Agriculture Canada laboratory in Vancouver, and we all wish her well in her career.

Glycol methacrylate plastic histology sections are now a routine service and is gaining some popularity due to the superior cytological detail that they provide for pathologists.

Immunohistochemistry or immunoperoxidase (IP) staining techniques on paraffin slides have been gaining wide acceptance in human medicine because they combine specificity with superior morphological resolution. The histology lab now offers an IP technique routinely for pemphigoid skin lesions in dogs. Another IP test is being developed for bovine respiratory syncytial virus on lung sections.

SCIMATE, a computerized filing system for reprints, was introduced that will eventually become universal for the Animal Health Division. It allows easy and rapid searching of scientific papers to access information quickly for efficient handling of the diagnostic caseload.

A joint project, and publication, with Dr. Daniel Martineau of St. Hyacinthe was completed demonstrating Herpesvirus in skin lesions of marine mammals from the St. Lawrence River.

An interesting field investigation was completed by Dr. Armstrong on serological response of feedlot cattle to BRSV vaccination demonstrating essentially equal response in both vaccinates and nonvaccinates.

Much time and effort was expended by Histology & E.M. staff in finalizing plans for the proposed renovations in the O.S. Longman Building. Work is to begin in mid-1986.

The unit values system of work measurement was investigated and adapted for the Histology & E.M. section to be in place for 1987. The entire Reference Laboratories Branch will be utilizing the system in the near future.

STEP employees made significant contributions in project work producing an excellent reference file of the normal ultrastructure of virological tissue cultures and advancing our expertise in immunohistochemistry techniques.

Bacteriology-Mycology Section

There was an increase in workload in the bacteriology section in 1986 compared to 1985. Major factors influencing this increase were due to a substantial increase in submissions requiring Leptospira sp. detection and considerable involvement with project related work, both developmental and disease monitoring and investigation.

The laboratory staff participated in a Meat Inspector Orientation Program demonstrating, on numerous occasions, specimen processing and bacteriological identification skills and techniques.

One visiting Indonesian veterinarian spent several months in the laboratory observing and participating in diagnostic procedures.

Quality control continued to include quarterly control samples from the College of American Pathologists and control isolate exchanges with the regional laboratories.

A greater emphasis was placed on resource accountability. The laboratory continued to use the "Canadian Workload Measurement System" to measure workload. Cost accounting of media and consumables was done in order to identify procedure costs and project requests.

Training sessions were attended by the laboratory staff regarding use of the newly acquired automated microbiology system (Vitek).

A bench manual was prepared to include all diagnostic protocols used in the laboratory.

Shipping and handling "Dangerous Goods" became an issue which necessitated a greater knowledge of government and courier regulations.

An automated microbiology system (Vitek) that performs identification and susceptibility tests (giving minimal inhibitory concentration values) was introduced into the diagnostic laboratory. The systems potential allows for a continuous updated database and will permit supplementary files to be compiled and added for veterinary pathogens not presently in the system. Future expanded capabilities include an information management system for data storage, sorting, retrieval and reporting.

Diagnostic capabilities were expanded to include: numerous new media preparations introduced for improving bacteria recovery, e.g., for differentiating Group B Streptococcus, for Yersinia isolation, for E. coli 0157:H7 screening; immunofluorescent studies for a variety of Leptospira serovars; serotyping facilities for Actinobacillus pleuropneumoniae types 1 through 7, by immunofluorescent technique; detection of E. coli containing 987P and F41 fimbriae by immunofluorescent procedures.

Bacteriological support was given to numerous projects initiated within our division. These included: serotyping Actinobacillus

pleuropneumoniae from designated known infected premises; Bacteriology Feedlot Project; transmission studies involving domestic and Bighorn sheep using Pasteurella haemolytica type T; to distinguish between invasive and non-invasive E. coli from poultry submissions using a Congo-red medium; providing haematological studies for a project to determine any observable abnormalities, in cows, that could be attributed to sour gas well blow-out emissions; transmission studies in chickens using an E. coli bacteria.

Projects initiated outside of the devision in which bacteriological support was given: bulk milk tank samples were examined for the presence and prevalence of Streptococccus agalactiae - this project was in co-operation with the food testing and the central milk testing laboratories; susceptibility patterns for the combination drug Linco-Spectin were monitored, as requested by industry (TUCO), using field case isolates from poultry and animal necropsy submissions.

Interesting cases included: our first isolation of Blastomyces dermatitidis, from a dog submission; one positive case submission (two specimens) for Brucella abortis.

Mycoplasma/Ureaplasma: Diagnostic and service responsibilities continued for the identification of species and/or serogroups within the genus Mycoplasma, Acholeplasma and Ureaplasma. Field case isolates included Mycoplasma arginini, Mycoplasma hyorhinis, Mycoplasma gallinarum and

Mycoplasma bovis. Developmental work, which expanded diagnostic capabilities, included quality control on specific antisera received from the FAO/WHO Collaborative Centre for Animal Mycoplasmas (Aarhus, Denmark), for use in immunofluorescent studies. Particular emphasis was placed on Mycoplasma species identification expected from porcine and avian host submissions. Special selective media requirements by fastidious species, were fine tuned and incorporated into the routine when quality control studies were favorable.

TOXICOLOGY SECTION

General Comments and Activities

During the previous year, the toxicology laboratory underwent a fairly revolutionary and dramatic reorganization which saw it evolve from a laboratory serving a variety of agencies to one focusing singularly on agricultural issues; veterinary toxicology and water analysis. Our first complete year of operation under this new direction was completed in 1986. As anticipated, the laboratory has been orientated towards nutritive metabolic testing. A major portion of our analysis is measuring the nutritive status of animals, particularly in the area of macro minerals, trace minerals and vitamins. This work is designed to emphasize our commitment to the role of preventive medicine by assessing the status of the herd.

Some clinics have begun to use laboratory analysis to augment their herd health practice, particularly in dairy cattle. Animal productivity was monitored by both record keeping systems and metabolic status. Veterinarians monitored the animal's blood status before and after dietary changes. Usually, differences can be detected in nutritive status. Although monitoring of blood values may be considered by some to be an experimental exercise, firm recommendations for certain trace mineral supplementation can now be made without the recourse to more expensive laboratory monitoring.

The purpose of our work to a great extent serves to develop recommendations, for procedures which no longer require laboratory testing of individual animals as this becomes an expensive means of maintaining health and productivity. Based on the findings in this laboratory to date, we have been able to direct ourselves away from some expensive laboratory testing being able to give firm advice on the nutritive supplementation.

Mycotoxin methods development was an initial goal of this laboratory at the time of its reorganization. This goal has been reached and analytic procedures for mycotoxins are in place and well established for accuracy and sensitivity. Participation in the mycotoxin project with Alberta Environmental Centre still remains a major commitment and hopefully during 1987 this project will be concluded. Even though we have established that the toxigenic producing strains of fungi are most definitely present in Alberta, naturally occurring trichotecene mycotoxins do not appear to be a significant problem in the field because climatic conditions apparently are not suitable to promote the production of toxins. The only mycotoxins identified in Alberta feeds have been those imported from the United States.

The capability of testing feeds for mycotoxins has created some problem of perception. Producers with mold damaged feed and having received a negative mycotoxin analysis often conclude the feed is quite satisfactory for animals. It has been necessary to impress on these

producers that mycotoxin production is only one aspect of damage that can occur from mold damaged and spoiled feeds and that a negative mycotoxin test is no assurance the feed will be satisfactory for animal health.

Quality control procedures were continued through the Canadian Association of Pathologists. Selenium analysis was used to compare our findings with three other laboratories using four different methods: Graphite Furnace, Zeeman Modification AA, HP Liquid Chromatography and Nuclear Activiation Analysis. These tests were carried out in conjunction with our laboratory, Western College of Veterinary Medicine, Saskatoon, and the Diagnostic Laboratory, Columbia, Missouri and the Research Council of Missouri. The findings from these analyses demonstrate all four analytic techniques have agreed very closely and it has given some confidence that our techniques are as accurate as those being performed elsewhere.

Environmental toxicology is a significant activity of our section. Major developments in this area were participation in the development of an emergency response team at an uncontrolled sour gas release site. In co-operation with other Department personnel we have produced a plan for the initial response to an uncontrolled sour gas release and we have developed a protocol for documenting the results and conducting a clinical investigation of health effects following the blowout. Two mock blowout trials were attended by Animal Health Division personnel to

become familiar with the established emergency response procedures. In addition, the toxicology laboratory has now purchased a headspace/purge trap attachment for the GC/Mass Spectometer which will give us the capability of analyzing air samples and gas samples that can be connected with any type of gaseous environmental contamination. In addition, it will also extend the versatility of our Mass Spectometer instrument.

The section has been busy adapting the Gas Chromatograph/Mass Spectometer for use in diagnostic samples. The Mass Spectometer is normally used as a confirmatory instrument to positively identify any type of organic substance isolated. We have expanded the role of this instrument to be that of an initial investigatory instrument in which rudimentary prepared samples can be injected to screen for any possible unknown organic substance in the material being tested. This obviously has some limitations, but it has expended the use of this machine a hundred-fold in our laboratory.

A workshop on the Effects of Acid Forming Emissions in Livestock in Alberta was organized in November and has served to accumulate most of the known information on the effect of acid gases in the petroleum producing industry. A proceedings will be developed from this workshop and will serve as a useful source of reference material.

The most difficult aspect of the past year has been informing one staff member that due to the restrictions in government employment policy, they would have to seek work elsewhere. This created a difficult situation, but with adequate counselling the person has gone on to a new career and another university degree.

Methods Development

The following methods were expanded, developed, researched or otherwise improved within our armamentarium of applicable techniques.

1. Selenium Response Panel of Tests

Selenium deficiency is one of the most significant diseases dealt with by the toxicology laboratory. After considerable effort we have developed a broad range of capabilities which includes analysis for selenium, vitamin E, creatinine phosphokinase and glutathione peroxidase. By applying this battery of tests to a particular problem, we can offer what essentially is the ultimate level of laboratory capability. The vitamin E test has been particularly difficult to develop because we have been plagued with equipment problems and have essentially spent our time troubleshooting instruments rather than developing techniques. However, in the end we hope to automate the vitamin A and E analysis on a separate instrument which will allow further development of techniques on our HPLC.

2. Cyanide Marker and Detection

A new, simple and extremely rapid technique was developed to detect cyanide in animal tissues. A specific blue dye was incorporated into the cyanide bait used by pest control officers. By detection of cyanide and the appearance of the blue dye, we can definitely identify the source of the pesticide.

3. Urea and Oxalates in Feed

While analysis for these products is nothing new to an analytic laboratory, we have modified a number of techniques to achieve more rapid identification of these products. The result has been the identification of urea on our Multi Stat III, an automated instrument, and have identified urea toxicosis. In one instance, this resulted in a feed company compensating the farmer as the results could be immediately at hand.

4. Identification of Hydrocarbons

By obtaining a variety of hydrocarbon products, we have been able to establish a finger print method of identifying crude oil, weathered crude oil, weathered refined oil, refined oil and crankcase oil. All of these products are involved in poisoning of animals. The weathering process refers to the evaporation of the more volatile components leaving the less volatile components behind for analysis. In spite of the loss of such volatile components, we are now able to identify the origin of some of these oily products. By this process, the unknown

source of hydrocarbon poisoning may be identified or a source of oil, such as an oil well, may be identified for litigation purposes.

5. Calcium in Kidney for the Diagnosis of Ethylene Glycol Poisoning

Ethylene glycol is becoming a more significant malicious poison in dogs. The method of diagnosis depends upon the stage in which the animal is presented. In the very early acute stages ethylene glycol can be isolated from the bloodstream and identified. This gives immediate direction to a clinician for treatment. However, there is a stage between ethylene glycol disappearing from the blood and calcium oxalate crystals not yet appearing in the urine. This presents the greatest diagnostic dilemma. This problem can now be solved by doing a calcium analysis of the kidney in which calcium oxalate is present, but not yet in detectable crystalline form. Elevated levels of calcium in the kidney may permit a diagnosis.

6. Anatoxin Degradation

Algae poisoning was a problem during the summer of 1986. Often water for algae poison analysis has been collected for several days before it arrives at the laboratory and the anatoxin has degraded. We have established a technique for detecting the breakdown product of anatoxin, which will permit identification of a previously formed poison being present in the water.

7. Carbofuran Analysis

We have developed an analysis, characterized for its rapidity, to be used in clinical toxicology which provided immediate identification of carbofuran. It is designed to detect only poisonous amounts of the product in a dog's stomach and is not designed to find very small environmental contamination levels. This enhances our role as a diagnostic laboratory by providing more answers.

8. Zearalenone

Zearalenone contamination in feed has been questioned for many years. We have observed some clinical signs which would suggest it is present. We have now developed a test to detect clinically significant levels of zearalenone in feeds.

Projects

The following projects were begun and mostly completed during the year:

1. Feedlot Selenium Trial

This was performed at the request of the Health Management Branch. The purpose was to determine if there were any perceived health problems associated with selenium levels in incoming feedlot animals. A large number of samples were analyzed. To date, analysis has not been completed.

2. Selenium/Glutathione Peroxidase in Bighorn Sheep

This was a co-operative project with the Fish & Wildlife Department. One of their technicians worked in our laboratory to develop the glutathione peroxidase test. The objective was to determine whether a relationship existed between selenium levels and glutathione peroxidase activity in bighorn sheep. Published literature suggests there is an inverse relationship between selenium and glutathione peroxidase in mountain goats. This was interpreted to indicate that goats had evolved in selenium deficient areas without requiring selenium. The bighorn sheep study found there is a direct relationship between the levels of selenium and glutathione peroxidase. Three herds were examined; one herd proved to have low selenium and glutathione peroxidase, one an intermediate level and one a higher level. There was no correlation in the herds between their health status and the level of selenium glutathione peroxidase.

3. Rondeau Cow Project

This project consisted primarly of collecting blood samples and conducting a large array of biochemical tests to elucidate if any damage occurred in cows exposed to a sulphur polluted environmental atmosphere. The project also served to establish normal values for many of our biochemical tests.

4. Plasma Cortisol Project

This test was developed for studying bighorn mountain sheep for Dr.

Detlef Onderka. The result was accurate measurement of cortisol levels.

5. Acute Phase Protein Project

It was hoped that measuring acute phase protein response to inflammation would offer another tool by which lesions of pneumonia could be aged in feedlot cattle. The project was performed in sheep. We were unsuccessful in demonstrating a change in acute phase proteins as a response to inflammation. We feel this is primarily because there is insufficient antigenic cross-reactivity between acute phase proteins and human acute phase protein. The project will continue in the next year.

6. Ionaphore Project

The analysis of lasalicid, monensin and amprolium remain a significant challenge for our laboratory. The development of suitable techniques has been fraught with difficulty. We are now capable of analyzing for amprolium and have been unable to successfully analyze for lasalicid and, even though we can analyze monensin, we are unable to gain sufficient sensitivity in the test to be of clinical usefulness. Efforts will continue to develop this important capability.

7. High Moisture Silage Preservation with Ammonia

The literature suggests that 4-methylimidazole products are produced by reaction of ammonia with feedstuffs. We attempted to analyze feeds for this compound but were unsuccessful in developing a sufficiently sensitive test that would adequately identify the 4-methylimidazole.

8. Hormone Growth Promoters

A project is presently underway to analyze Ralgro and Synovex implants recovered from the ears of slaughter cattle to determine the level of residues. The literature is imprecise and unclear regarding how much product remains in the animal following implantation and when the animal is completely free of the implanted material. The initial results would suggest that animals may not be free of the implanted chemicals at the recommended time of withdrawal.

9. Selenium/ Vitamin E Feedlot Immunity Project

This is a fairly large project conducted in co-operation with the Animal Science Department at the University of Alberta and the Microbiology Department with the Western College of Veterinary Medicine. Animals will be introduced to a feedlot and followed during the course of the feedlot trial our laboratory will determine the selenium status. There will be a fairly elaborate immunologic array performed on these animals at Saskatoon and this will be correlated with the selenium and trace mineral status of the animals.

Interesting Cases

1. Cattle Deaths at Rimbey

Thirty cows died and seven were debilitated by a strange disease outbreak characterized by corneal opacity, severe liver, kidney and myocardial damage with blindness and death. The nature of the occurrence strongly suggested poisoning in the cattle. The cattle were

in association with a gas well on the property which has experienced a hydrate plug in the gas line, which necessitated a depressurizing procedure and caused an expulsion of gas line materials through the flare stack. This contaminated the surrounding country with diethylene glycol, which also contained methyl alcohol and a variety of other chemicals. Diethylene glycol could be demonstrated in the animals. The toxicology of diethylene glycol and those known chemical components cannot entirely explain the death in these animals. Although a conclusive diagnosis was not possible, the case came to an amicable conclusion between the owner and the company involved.

2. Psoralens

There was an episode of photosensitization during the summer of 1986 in which a field of timothy previously used for horse feed, for the past five years, caused photosensitization in all grouped animals. It would appear that psoralens were produced in the hay. Psoralens are a plant hormone or chemical produced by the plant in response to a fungal infection. These chemicals are described as long chained furo-coumarins and essentially the plant uses them as an antibiotic against a fungal infection. The furo-coumarins are known to be absorbed by the gut, circulate in the bloodstream to the periphery and react with ultraviolet light to form oxatative active species causing skin lesions. While we have the technique for analyzing for these products, and essentially it uses the same elaborate extraction procedures as mycotoxins, the technique is sufficiently expensive and difficult that it cannot be used

as a routine examination.

3. Vitamin D Toxicosis in Jersey Cattle

Following investigation it was discovered that vitamin D preparation used for the prevention and control of milk fever in Jersey cattle incurs a tragic risk of vitamin D toxicosis. An entire herd of Jersey cattle were discovered to be suffering vitamin D toxicosis resulting in florid calcification of the arteries and veins in the body.

4. Anatoxin

Because of the unusual climatic conditions this summer, algae poisoning occurred earlier than normal and resulted in several herds being poisoned. Fourteen cows in one herd had dropped dead within the space of 10-15 minutes after drinking the contaminated water of a natural lake. In addition to extensive analyses of farm water supplies to determine the extent of the problem in the farming community, the laboratory developed further refinements to present tests to detect the toxin after extensive time days.

5. Other

Other interesting cases of poisoning diagnosed in food-producing animals during the year included methanol poisoning, potassium chloride poisoning, several instances of fertilizer consumption with dire results, copper sulfate poisoning, amprolium poisoning, larkspur cicutoxin and a growing number of herbicide problems.

REGIONAL LABORATORIES BRANCH

The Regional Laboratories Branch was responsible for operation of the laboratories in Airdrie, Lethbridge and Fairview. A complete animal disease diagnostic service was offered to livestock and poultry producers and veterinarians in northwestern, central and southern Alberta. Consultation was also provided to livestock owners, veterinarians, the livestock industry and other government agencies regarding animal disease, its diagnosis, control and prevention. The Airdrie and Fairview laboratories also participated in the instruction of students enrolled in the animal health technology course. The Fairview laboratory was very involved in the instruction of students from Fairview College and the Northern Alberta Institute of Technology while the Airdrie laboratory played a lesser role in instruction of students from Olds College.

HEALTH MANAGEMENT BRANCH

The prevention and control of diseases in livestock herds, the administration of animal health programs, safeguarding human health by control of designated diseases, and enforcement of regulations for sale of livestock medicines were major responsibilities of the Health Management Branch in 1986. Techniques for disease prevention and improved production were emphasized to livestock producers and veterinarians in the province. Private veterinarians were a key link in providing information and service at the producer level with over 150 veterinarians participating in the various programs.

Services provided through the Health Management Branch in 1986 were the swine herd health program, Alberta certified preconditioned feeder program, community pasture health program, auction inspection program, northern veterinary clinics program, and field assistance provided to veterinarians and animal owners in the diagnosis of unusual disease problems. Extension services were provided both directly via Health Management Branch staff and indirectly through practicing veterinarians.

The Health Management Branch was responsible for the enforcement of various Acts and Regulations. The provisions of the Livestock Diseases Act, including the auction market regulation, designated diseases regulation,

assembly station regulation, disposal of dead animal regulation, sheep foot rot regulation and livestock medicine regulation were supervised by the Branch in 1986. The Fur Farms Act and regulations and the Animal Protection Act were also administered by the Health Management Branch.

Work continued on revision of the Livestock Market Regulations, Livestock Medicine Regulations and the Fur Farm Regulations to make them more meaningful and effective. The Animal Protection Act underwent a major review process in consultation with the Alberta S.P.C.A.

ARDA Veterinary Clinics

Veterinary service continued from the six ARDA veterinary clinics in Alberta. The clinics at Edson, High Prairie, and Fairview were strong and viable practices. Additional income support was required at Valleyview, Manning, and Fort Vermilion in order to retain practitioners in these areas. A mileage assistance program in I.D. 23 was continued to encourage greater use of the veterinary services. Dr. Jim Farrish, took over the practice at the Fort Vermilion Clinic after the departure of Dr. Robert Gainer.

Preconditioning Program

There were 284 producers who participated in the

Alberta Certified Preconditioned Feeder Program in 1986, an increase of 54 producers over the previous year. There was an increase in participation in the northern and central areas of the province, while in the south, a decrease occurred, probably due to the abundance of fall grazing.

	1985	1986
No. Calves Certified	17,247	21,883
No. Calves Sold	9,467	9,023
No. of Sales	19	22
Average Additional Prices Received:		
(a) Steers	$5.90/cwt	$4.99/cwt
(b) Heifers	$4.40/cwt	$4.91/cwt
Average Days Weaned Before Sale:	50 (77 herds)	58 (55 herds)

During the preconditioning process, calves have been shown to gain significantly more weight than those not yet weaned providing an increased economic advantage. The proportion of all preconditioned calves that became sick and died in feedlots after sale in 1986 was 8.7% and 0.5%, respectively, compared to 21.6% and 1.4% for regular calves surveyed. The overall health status was good and 40% of the producers did not treat any animals and 66% experienced no death losses. Brian Harris again served as ACPF Coordinator assisting with administration of the ACPF program.

Research Projects

The Bovine Respiratory Disease Project, funded by Farming for the Future, continued as a joint project between Alberta Agriculture and Veterinary Infectious Disease Organization. The objective of the study is to determine the risk factors which are associated with the development of respiratory disease in feedlot cattle in Alberta. Dr. Susan Wilson organized the data collection and began an analysis to determine the factors which increase the risk of disease in feedlot calves.

Gas Well Blow-Outs

Work continued in order to determine if there are long term effects on cattle due to toxic gas emitted from gas well blow-outs. Dr. Fenton spent considerable time investigating problems associated with toxic gases, as well as, livestock poisoning due to oil field spills.

EPIDEMIOLOGY SECTION

The responsibilities of the Epidemiology Section included the administration of the Designated Communicable Disease and the Destruction and Disposal of Dead Animals Regulations under the Livestock Diseases Act. In addition, assembling information regarding disease prevalence in food producing animals, conducting and supporting extension activities, and conducting detailed investigations of disease problems in the field were a part of this section's responsibilties. Administration of the Swine Herd Health Program, drug and vaccine trials, and applied research projects were carried out as well. Veterinary practitioners conducted a high proportion of the inspections in the commercial section of the Swine Herd Health Program and several on seedstock herds. Practitioners participated in a number of local extension activities and occasionally conducted disease investigations on our behalf.

Epidemiology and Communicable Diseases

Broad surveillance of disease in food producing animals was continued by monitoring various laboratory and Health Management Branch reports and by means of computer searches. More detailed information was collected on those diseases which are of particular interest to the branch, primarily those named in the Designated Communi-

cable Disease Regulation. The following table shows the number of positive diagnoses for each of these diseases for 1986.

Cattle		Swine	
Leptospirosis	3	Leptospirosis	3
Salmonellosis	6	Salmonellosis	2

Sheep		Poultry	
Brucella ovis	0	ILT	11
Footrot	6	Salmonellosis	13

In each case, appropriate action was taken to control the outbreak and to prevent its spread to other premises.

A study was carried out to determine the accuracy of the ELISA test for swine infected with Actinobacillus (Haemophilus) pleuropnuemoniae. It was determined that this was a reasonably accurate test to detect the presence or absence of haemophilus pneumonia in a herd.

The results of the Brucella ovis survey conducted by our laboratory in conjunction with ADRI were published during the year in the Canadian Veterinary Journal.

Extension

Extension primarily in the spoken and written formats continued to be a very important function of the branch. Livestock producers were the main target audience. The monthly Animal Health Division Newsletter continued to

be an important means of communicating with veterinary practitioners and livestock specialists within the department.

Sixty talks were presented mainly to groups of producers and less frequently to other groups such as veterinarians and students. The largest number of meetings were related to beef cattle, with swine and dairy cattle the next most frequently addressed species.

Information transfer also involved trade journal articles including a regular column in the Western Hog Journal, fact sheets, telephone interviews for both publication and radio broadcast and various other publications.

Revisions of the following publications were completed: the Cow-Calf Manual, the Disease Control Calendar for Beef Cattle, the first five lessons of the Animal Health Home Study Course, the Pork Production Home Study Course, and the health lesson of the Dairy Production Home Study Course

A library of scientific reprints was commenced during the summer by a STEP student using SCIMATE, a computerized reference system. The branch film and slide kit library was not used as frequently by veterinary practitioners as in previous years.

Disease Investigations

In depth investigation of disease problems was

carried out by members of the branch on 16 farms. The majority of these investigations were requested by practicing veterinarians who were seeking further assistance with the problem. Occasionally, a follow up visit was required.

The majority of these investigations involved dairy or beef cattle, although one was related to swine and one to horses. Reproductive problems, mastitis, leptospirosis, abortions, pneumonia and scours were encountered in cattle, diarrhea in young pigs and pulmonary edema in horses.

Swine Herd Health Program

Enrollment in the program declined slightly in 1986 primarily due to the fact that a number of commercial herds completed their four year term of enrollment. In addition, several herds were deleted from the program for failure to pay their annual enrollment fee. Nevertheless, interest in the program, particularly on the part of commercial producers remains high and a substantial number of new commercial herds were enrolled.

Health Management Branch veterinarians continued to conduct the majority of the inspections in the seedstock section. In addition, they carried out many of the initial inspections on new herds joining the program and the occasional regular inspection of commercial herds.

Disease problems did not prevent any herd from using ROP Test Station space during the year, or from entering any of the major swine shows and sales.

The general health status of herds enrolled on the program remained good. Mange continued to be a widespread problem in the province and although atrophic rhinitis or haemophilus pneumonia were reported in some commercial herds, fortunately all the seedstock remained clinically free of these diseases. Stress related diseases such as Streptococcus suis Type II and intestinal adenomatosis were recognized more frequently. Diseases influenced by management such as the mastitis metritis agalactia complex, scours and pasteurella pneumonia occurred most frequently.

The number of snouts and lungs examined to monitor the health status of seedstock herds was considerably less than in previous years, due to labour problems in the packing industry. No specimens could be collected during this industrial dispute which lasted for several months in Edmonton. Because the value of snout scoring depends, to a large extent, on examining an adequate number of heads, a review of the retrieval system was carried out. In addition, a new system of lung scoring was proposed.

The Advisory Committee met in April when the feasibility of a separate named category for the minimal

disease herds was discussed. It was agreed that a new category named High Health would be initiated and invitations were sent to qualifying herds late in the summer to enroll in this category. By the end of the year, eleven herds had submitted applications.

Thirty-four practicing veterinarians were involved with inspections of enrolled herds during 1986. Despite the fact that a relatively small number of veterinarians did the majority of the work, interest among veterinarians in swine practice is increasing, particularly among new graduates.

Summary of Activities for 1985-1986

	1985	1986	% Change
Number of seedstock herds	56	49	-12
Number of commercial herds	191	171	-10
Total membership	247	220	- 8
Number herds added to program	67	37	-44
Number herds deleted from program	59	64	+ 8
Number herds visited - HMB staff	86	68	-21
Number herds visited - practitioners	473	514	+ 9
Number snouts examined for scoring	2237	974	-56
Overall mean snout score (Scale of 0-5)	0.71	0.55	-23
Number lungs examined for scoring	5040	1769	-65
Overall mean lung score (Scale of 0-3)	0.53	0.46	-13

LIVESTOCK INSPECTION SECTION

Livestock Market Regulations

Livestock inspection is conducted at all auction markets in the province by private veterinary practitioners who are appointed as inspectors under the Livestock Diseases Act and are employed by the Health Management Branch.

The purpose of auction inspection is:

(1) To decrease or stop the spread of disease through public sales of livestock;

(2) To increase buyer confidence and, in turn, create a better market for producers;

(3) To monitor the condition of the livestock markets in regard to construction, repair, and sanitation;

(4) To be prepared to assist the federal veterinarians in the control of a foreign disease outbreak.

The Alberta livestock inspection program is concerned with detecting any infectious disease. Veterinarians inspecting at auction markets watch for diseases of national economic importance (federally reportable diseases) and more commonly, diseases of local economic significance.

Veterinary inspection was provided at 49 auction markets which were licenced for full-time operation and 15 auctions which were licenced for occasional sales. Severe

fires were experienced at both the Olds Auction in Olds and Triple J Auction in Westlock. The market in Olds rebuilt their facilities while Triple J auction moved to a new site and erected a new facility. The Thorsby auction market reopened after being closed for several years.

Drs. Fenton and Shute supervised the inspection program which involved orienting new inspectors, co-inspecting with established inspectors, conducting regional meeting with inspectors and communicating with auction operators on an individual basis and with their association. Livestock Market Regulations continued to be reviewed.

During 1986, 1,747,239 animals were inspected, down slightly from 1985 (1,899,657) and the number of sales decreased marginally from 3,333 in 1985 to 3,136 in 1986. The average cost of inspection was .27¢ per animal.

The most common causes for rejection/slaughter of cattle at auction markets were cancer eye, respiratory and febrile conditions, lameness, and lumpjaw. In swine, the most common reasons for rejection/slaughter were underweight, respiratory conditions and arthritis. Footrot was the leading cause for rejection/slaughter of sheep.

Sheep Foot Rot Regulation

Under the authority of the Sheep Foot Rot Regulation ten flocks were quarantined and six herds were removed

from quarantine. This quarantine prohibits the sale of sheep for any reason except slaughter, and remains in effect until the disease is shown to be eradicated from the flock.

Assembly Stations

Fifty-four assembly stations were supervised for operational standards and sanitation. The quality and size of these stockyards varies considerably. Most met the requirements of the regulation; the most commonly encountered problems related to deterioration of loading chutes and fences.

Community Pastures

Veterinary inspection of all livestock at entry was provided at 43 pasture locations in 1986 by veterinary practitioners employed under this program. These veterinarians also provided health services throughout the grazing season. Inspection of a total of 107,188 cattle and 14,923 sheep was carried out involving a total of 191 entries. The average cost of providing these services was .55¢ per animal. The Hays Provincial Grazing Reserve expanded its sheep grazing capacity and increased numbers of sheep are using the pasture.

There were significant outbreaks of pneumonia at Minburn and Rannach provincial grazing reserves an

blackleg at Rannach and Wanham provincial grazing reserves. All of these required extensive veterinary service, drugs, and labor.

Suspicion of leptospirosis at the Connor Creek provincial grazing reserve required an in-depth investigation. Several patrons had complained that calf crops were less than expected while one patron experienced several losses due to abortion. A serological survey determined that a high percentage of cattle in the area had been exposed to the organism. In the one herd which experienced abortion losses, tests indicated that leptospirosis may have been the cause. However, the majority of undocumented losses in no way reflected widespread abortion due to Leptospirosis.

Sixty-eight post-mortem examinations of animals from community pastures were performed by veterinary practitioners. The most common causes of death on the pastures were pneumonia, blackleg, and abomasal ulcers.

The Medicine Lake provincial grazing reserve maintained its sheep foot rot free status with even less veterinary effort than in the previous year.

Dr. Fenton and Shute attended some meetings of patrons to advise on health management of animals or specific disease problems. They also conducted educational seminars for pasture supervisors and their assistants.

Livestock Medicines

The purpose of maintaining licenced outlets under these regulations was to provide farmers and ranchers with a convenient source of certain livestock medicines. Regular supervision was provided to ensure they met the requirements of the regulations. Two hundred sixty-eight premises were licenced and monitored by one full-time inspector in 1986.

The majority of licenced outlets were found to be operating within the scope of the regulations. Violations included illegal advertising, and the sale of outdated or unauthorized drugs or biologicals. A major review of the Livestock Medicine Regulation was undertaken.

Fur Farms

The Branch continued to maintain its responsibility for licencing fur farms. There were a total of 76 licences issued in 1986 including: 10 mink; 36 fox; 27 chinchilla; 1 lynx; 2 fitch. This was an increase from the 55 licences issued in 1985.

Interest in fox farming remained high. There are four or five fur farms attempting to successfully breed lynx in captivity, with limited success so far.

The Fur Farm Regulations was reviewed and changes proposed. Dr. Shute attended meetings with the fur farmers in regard to these proposed changes.

CATTLE

Reasons for Rejection/Slaughter

	1982		1983		1984		1985		1986		
	No.	%	No.	%	No.	%	No.	%	No.	%	
Abscess	166	2.4	143	2.5	107	1.7	106	1.8	77	1.4	
Arthritis	82	1.2	87	1.5	126	2.0	119	2.0	89	1.7	
Bloat	---	-.-	87	1.5	37	.6	38	.6	27	.5	
Cancer Eye	1787	25.8	1325	23.2	1569	24.9	1371	23.1	1452	27.1	
Cardiac	---	-.-	49	.9	33	.5	28	.5	38	.7	
Central Nervous Disorders	---	-.-	35	.6	15	.2	12	.2	26	.4	
Distress	---	-.-	143	2.5	155	2.4	208	3.5	168	3.1	
Enteritis	129	1.8	158	2.8	194	3.1	231	3.9	231	4.3	
Febrile	146	2.1	508	8.9	549	8.7	52	.9	---	-.-	*
Footrot	125	1.8	124	2.2	65	1.0	194	3.3	74	1.3	
Hardware	---	-.-	3	.0	9	.1	3	.1	3	.1	
Lame	463	6.7	576	10.0	602	9.5	634	10.7	690	13.0	
Lice	41	0.6	41	.7	30	.5	8	.1	---	-.-	
Lumpjaw	715	10.3	536	9.4	584	9.2	491	8.3	416	7.9	
Mastitis	201	2.9	136	2.4	147	2.3	166	2.8	189	3.5	
Metritis	12	0.2	0	.0	0	.0	0	.0	---	-.-	
Navel Infection	148	2.1	132	2.3	160	2.5	161	2.7	137	2.6	
Physical Abnormalities	---	-.-	85	1.5	46	.7	42	.7	20	.4	
Pinkeye/Eyes	264	3.8	316	5.5	429	6.8	505	8.5	270	5.0	
Pneumonia	819	11.8	720	12.7	752	11.9	1008	16.9	811	15.1	
Ringworm	59	0.9	50	.9	182	2.9	119	2.0	158	3.0	
Under Age	22	0.3	21	.4	47	.7	37	.6	20		
Urogenital	---	-.-	223	3.9	228	3.6	202	3.4	239	4.5	
Warts	6	0.1	0	.0	0	.0	0	.0	---	-.-	
Other Diseases	1745	25.2	227	4.0	267	4.2	203	3.4	209	4.0	
TOTALS	5655	100.0	5725	100.0	6333	100.0	5938	100.0	5344	100.0	

* Beginning in 1986, "febrile" cases have been combined with "pneumonia".

SWINE

Reasons for Rejection/Slaughter

	1982		1983		1984		1985		1986	
	No.	%	No.	%	No.	%	No.	%	No.	%
Abscess	17	0.5	---	-.-	---	-.-	---	-.-	---	-.-
Arthritis	192	5.1	194	3.3	447	5.7	264	5.8	190	6.8
Central Nervous Disorders	---	-.-	---	-.-	11	.1	---	-.-	4	.1
Dermatitis	6	0.2	16	.3	67	.9	2	.1	1	-.-
Distress	---	-.-	99	1.7	420	5.3	189	4.2	83	3.0
Enteritis	40	1.1	61	1.0	206	2.6	34	.8	40	1.4
Lame	28	0.8	82	1.4	89	1.1	49	1.1	26	.9
Mange	799	21.1	1342	23.1	1839	23.2	1118	24.7	629	22.6
Parasitism	6	0.1	1	.01	23	.3	---	-.-	18	.6
Physical Abnormalities	---	-.-	56	1.0	31	.4	111	2.5	74	2.7
Pneumonia	30	0.7	159	2.7	356	4.5	92	2.0	28	1.0
Rhinitis	1285	34.0	1798	30.9	2016	25.4	1265	28.0	620	22.3
Underweight	1030	27.2	1820	31.3	2157	27.2	1202	26.6	1015	36.4
Other Diseases	347	9.2	187	3.2	258	3.3	193	4.2	60	2.2
TOTALS	3781	100.0	5815	100.0	7920	100.0	4519	100.0	2788	100.0

SHEEP

Reasons for Rejection/Slaughter

	1982		1983		1984		1985		1986	
	No.	%	No.	%	No.	%	No.	%	No.	%
Abscess	6	0.8	21	2.9	1	.1	1	.2	4	1.0
Arthritis	8	1.1	0	.0	2	.2	---	-.-	1	.2
Brucella Ovis	---	-.-	---	-.-	11	1.4	---	-.-	---	-.-
Distress	5	0.7	23	3.2	2	.2	1	.2	49	12.5
Footrot	572	78.9	550	75.7	680	86.5	494	85.9	210	53.6
Lame	97	13.4	11	1.5	28	3.6	---	-.-	24	6.1
Mastitis	4	0.6	7	1.0	5	.6	9	1.5	2	.5
ORF	---	-.-	62	8.5	29	3.7	---	-.-	---	-.-
Pneumonia	30	4.1	5	.7	15	2.0	13	2.3	66	16.9
Other Diseases	3	0.4	48	6.6	13	1.7	57	9.9	36	9.2
TOTALS	725	100.0	727	100.0	786	100.0	575	100.0	392	100.0

HORSES

Reasons for Rejection/Slaughter

	1982		1983		1984		1985		1986	
	No.	%	No.	%	No.	%	No.	%	No.	%
Influenza	2	3.5	1	2.1	2	3.5	9	16.3	2	6.3
Lame	--	-.-	8	16.6	13	22.8	10	18.2	6	18.7
Pneumonia	31	54.4	20	41.7	16	28.1	4	7.3	-	-.-
Strangles	7	12.3	6	12.5	10	17.5	--	-.-	4	12.5
Other Diseases	17	29.8	13	27.1	16	28.1	32	58.2	20	62.5
TOTALS	57	100.0	48	100.0	57	100.0	55	100.0	32	100.0

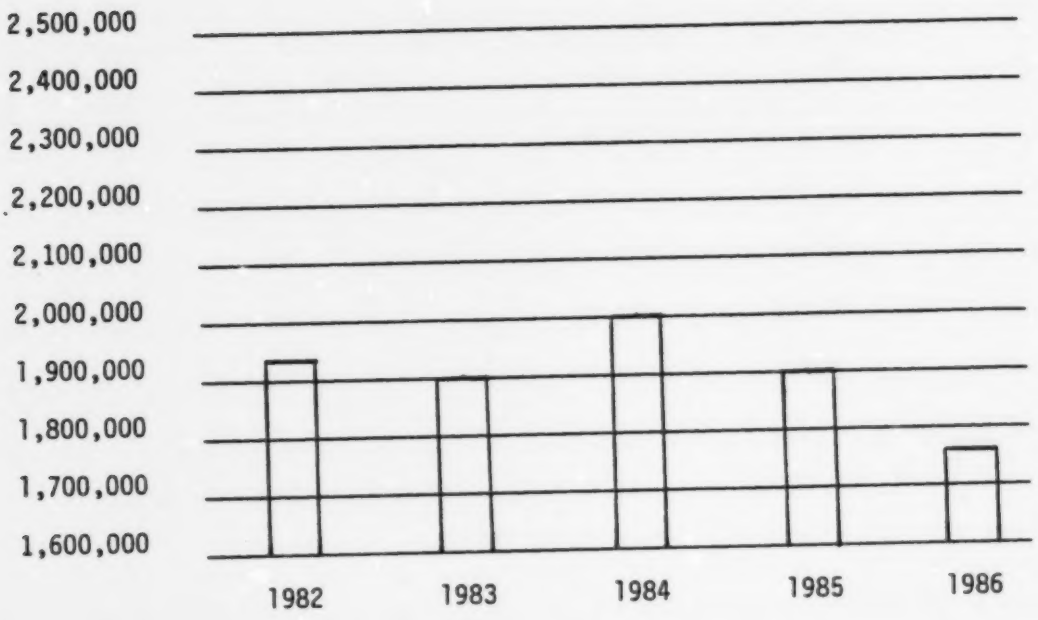
GOATS

Reasons for Rejection/Slaughter

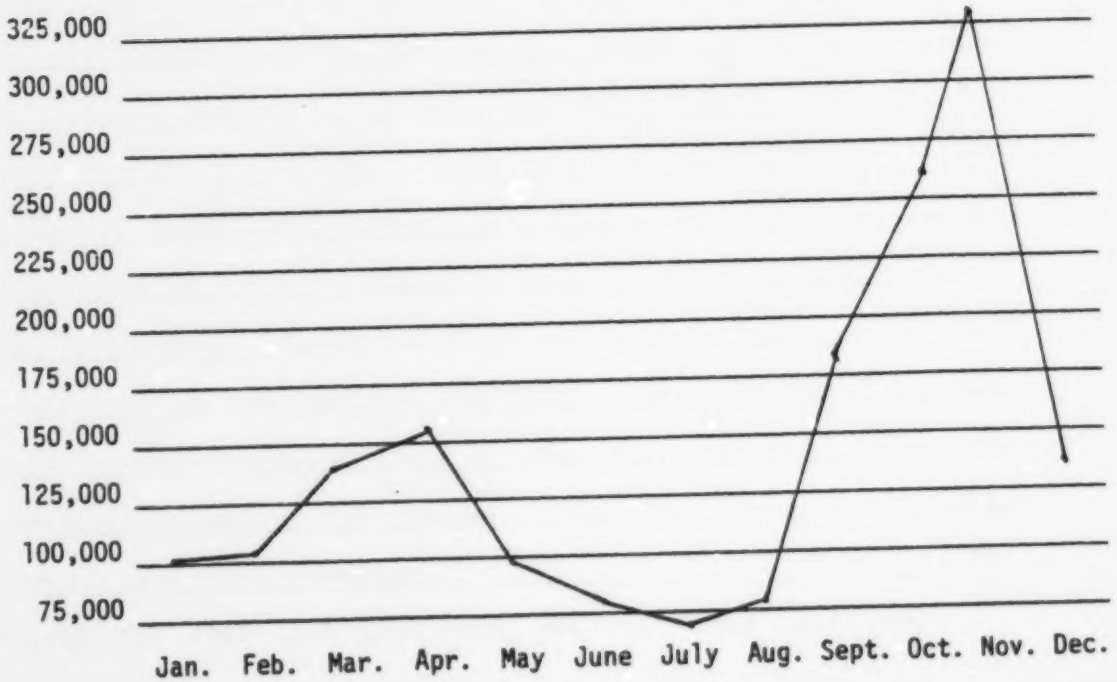
	1982		1983		1984		1985		1986	
	No.	%	No.	%	No.	%	No.	%	No.	%
Lymphadenitis	17	89.8	7	36.8	6	23.1	5	12.2	3	5.8
Mastitis	--	-.-	1	5.3	7	26.9	11	26.8	5	9.6
Pinkeye	--	-.-	--	-.-	--	-.-	1	2.4	-	-.-
Pneumonia	--	-.-	5	26.3	2	7.7	1	2.4	3	5.8
Skin Disease	--	-.-	--	-.-	--	-.-	3	7.4	-	-.-
Other Diseases	2	10.5	6	31.6	11	42.3	20	48.8	41	78.8
TOTALS	19	100.0	19	100.0	26	100.0	41	100.0	52	100.0

1982 - 1986

TOTAL NUMBER OF LIVESTOCK INSPECTED AT AUCTION MARKETS



TOTAL ANIMALS INSPECTED IN 1986



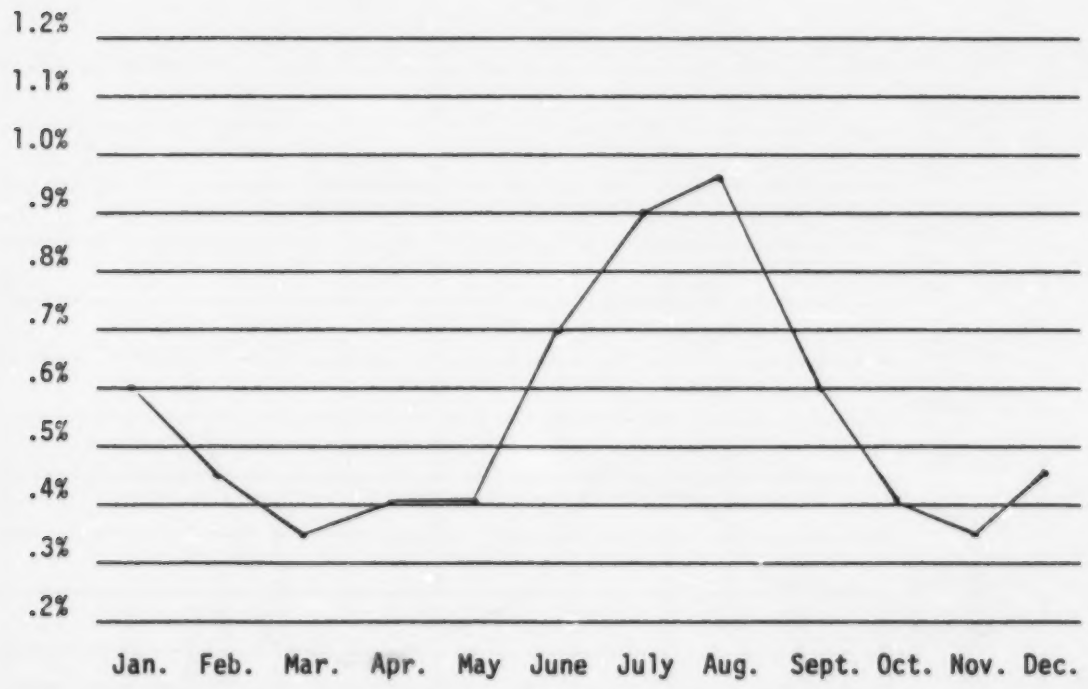
1986

SUMMARY OF RESULTS OF VETERINARY INSPECTION

No. of Auction Markets - 49 No. of Sales 3,136

	Inspected In 1986	Percentage Of 1985	Rejected At Sales		Slaughter Only Animals	
			No.	%	No.	%
Cattle	1,531,811	94.8	1,980	.13	3,389	.22
Swine	183,470	78.1	2,367	1.29	444	.24
Horses	19,369	100.7	18	.09	14	.07
Sheep	18,066	72.9	106	.59	286	1.58
Goats	4,846	81.4	50	1.03	3	.06
TOTALS	1,757,562	85.6	4,521	.3	4,136	.2

AVERAGE REJECTION RATE FOR ALL ANIMALS INSPECTED - 1986



MEAT HYGIENE BRANCH

The Meat Hygiene Branch was responsible for the administration of the Meat Inspection Act and Regulations including the delivery of the meat inspection service to abattoirs and investigation of alleged violations. The Act is intended to ensure a safe and wholesome meat supply for the citizens of Alberta and to foster expansion of the meat processing industry in rural areas of the province.

During 1986 the Meat Hygiene Branch employed 2 supervisors, 6 regional supervisors, one clerk-typist and 34 inspectors on a full time basis. We also employed 22 inspectors and 126 veterinarians on a part time basis.

Inspection was provided to 74 red meat plants and 87 poultry plants including 79 operated by Hutterite colonies.

Livestock inspected during the year included 38,858 cattle; 85,970 hogs; 5,295 sheep; 1,097 goats; 58 buffalo; 18,270 rabbits; 2,298,087 broiler chickens; 276,110 fowl; and 129,422 ducks, geese, turkeys and pheasants. We estimate that 40% of the cattle and 15% of the hogs were custom-slaughtered, but at least half of this amount was subsequently sold by the producer. Negligible amounts of the other species were custom-slaughtered.

Cattle slaughter decreased marginally from the previous year and hog slaughter increased markedly. Other classes of livestock are relatively stable. Carcass condemnations for the year were approximately 1.2% for cattle; .9% for hogs; .36% for sheep; 2.2% for goats, and 2% for poultry.

Enforcement activities continued during the year with approximately 125 possible violations being investigated. Most were found to be in violations, and the bulk of these were persuaded to cease their activities. One abattoir operator was convicted of assaulting an inspector and several charges are pending against another abattoir for slaughtering without the services of an inspector.

At the end of 1986, there were 60 mobile butchers registered, although only approximately 20 were active. Mobile butchers reported slaughter of 1,319 cattle; 77 hogs; 16 sheep; 1 buffalo; 12 goats. These animals were not inspected and the Regulations require that the meat from animals slaughtered by mobile butchers shall be consumed on the farm on which the slaughter took place.

LIVESTOCK PREDATOR AND BEEYARD COMPENSATION PROGRAMS

These programs are administered in the division with decisions concerning compensation made by committees operating in the Peace River district processing claims from that area and in Edmonton for claims originating in the balance of the province. The committees are comprised of representatives from the animal industry division, animal health division, fish & wildlife division of energy and natural resources, plant industry division and farmers or beekeepers actively engaged in livestock production.

The programs are to compensate farmers suffering livestock losses through predation and beekeepers suffering bear damage.

The following table will summarize the claims processed, monies distributed and a breakdown of claims for the year.

	PREDATORS	BEEYARDS
Claims:	871	25
Rejections:	218	4
Approvals:	653	21
Monies Paid	$200,718.74	$4,134.00

Predator Claims

Bears	Coyotes	Wolves	Others
95	431	58	69

1 9 8 6

PREDATOR LOSS INDEMNITY PROGRAM - APPROVED PREDATOR CLAIMS

SOUTHERN COMMITTEE

PREDATOR SPECIES	CATTLE	CALVES	SHEEP	GOATS	SWINE	POULTRY	# OF CLAIMS	INDEMNITY
Coyotes	9	185	996	21	43	1,544	369	$ 90,547.30
Bears	34	53	27	0	0	0	66	27,697.50
Wolves	6	73	17	0	0	0	27	14,430.00
Others	3	8	229	3	0	2,499	67	24,105.46
Totals	52	319	1,269	24	43	4,043	529	$156,780.26

PEACE RIVER COMMITTEE

Coyotes	1	23	171	0	0	0	62	$ 11,322.50
Bears	11	24	1	0	0	17	29	9,016.18
Wolves	38	94	1	1	0	0	31	23,400.00
Others	0	0	0	0	6	79	2	199.80
Totals	50	141	173	1	6	96	124	$ 43,938.48
TOTALS:	102	460	1,442	25	49	4,139	653	$200,718.74

DISEASE STATUS REPORT

Cattle

The bovine population continued to have a high standard of health and to be free of exotic disease. Respiratory disease was one of the major problems seen during the year. Pneumonia in calves was particularly prevalent in the fall, with interstitial pneumonia occurring as frequently as fibrinous pneumonia on some premises. Bloat and BVD were also significant causes of loss.

Bacterial abortion was the main cause of fetal wastage with Corynebacterium pyogenes being the most frequently isolated organism. Of the viral etiologies, IBR was the most commonly diagnosed.

As in previous years, neonatal diarrhea was an ongoing problem with a number of viral and bacterial etiologies disclosed. In addition to the traditional staphylococcal and streptococcal mastitis cases, a significant number of milk samples revealed coliform organisms. This maybe a reflection of physiological stresses on our dairy cattle.

No disease problems new or unusual to the province of Alberta were encountered.

Swine

Diseases seen in swine tend to be primarily enteric or respiratory. By far, the most frequently made diagnosis was enteritis due to Escherichia coli. Pasteurella pneumonia and mycoplasma pneumonia were the two next most frequently seen conditions. Fewer cases of pleuropneumonia were diagnosed this year compared with previous years. A diagnosis of leptospirosis was made on a significantly higher number of cases than in previous years, primarily due to the investigation involving the AI station at Nisku. Other conditions seen less frequently included swine dysentery, gastric ulcers and suppurative arthritis.

The various manifestations of infection with Streptococcus suis Type II were seen with increasing frequency at all the laboratories.

Sheep and Goats

Our role with these species tends to be as much advisory as it is in performing diagnostic tests. In some cases this advice will result in a submission to the laboratory. Caseous lymphadenitis, coccidiosis and lactic acidosis (grain overload) were the most frequent diagnoses. Bloat, emaciation, enteritis due to Escherichia coli, suppurative meningitis and white muscle disease were also seen on a number of occasions.

Again, no disease problems new or unusual to the province of Alberta were encountered.

Poultry

The 1986 disease profile consists of commonly seen diseases associated with each stage of production. This included omphalitis in newly hatched birds, leg weakness in broilers and broiler breeders, sudden death syndrome in broilers, and peritonitis and egg production drops in laying hens. Ascites continued to be a difficult problem in broilers. Necrotic enteritis was the most commonly seen form of enteritis surpassing coccidiosis.

In turkeys, E. coli septicemia was the most common diagnosis. Perirenal hemorrhage was an important cause of death.

1986 ANNUAL REPORT: SPECIAL INVESTIGATIONS

Bovine Investigations

1. Bacterial Pneumonias of Feedlot Cattle

Bacterial pneumonias are a common cause of lost production in feedlots in Alberta. A prospective study to correlate pathology with clinical signs and stage of the disease was undertaken jointly by the Pathology and Regional Laboratories Branch. Dr. Pierre Daoust was the principle investigator and conducted the investigation at Thiessen's feedlot in Strathmore from early October to mid-December. The project is still underway and will be completed in 1987 following microscopic examination of the tissues collected.

2. Suspected Leptospirosis in a Grazing Reserve

An investigation about poor reproductive performance in a provincial grazing reserve was undertaken. A number of patrons complained about poor reproductive performance in their cows however only the patron initiating the complaint had adequate records and had performed pregnancy checking. The principle investigator, Dr. Ralph Shute, performed extensive

serologic testing of the herds of origin and the animals on the reserve. The only herd found to have significant serologic evidence of Leptospirosis was that of the owner originating the complaint. Based upon titres to Leptospira pomona and in view of the losses encountered in the herd and generally good reproductive management a presumptive diagnosis of Leptospirosis was made in that one particular herd.

3. Ageing of Lung Lesions in Feedlot Cattle

The age of lung lesions in cattle examined postmortem is often a useful piece of clinical information. Dr. Susan Crowe at the Airdrie Regional laboratory performed a retrospective study of the degree of agreement between the practitioners history and the histologic appearance of lungs from cattle with fibrinous pneumonia. A PEP position was obtained and under the direction of Dr. Crowe a retrospective study of submissions from 1985 to 1986 was conducted. Information was retrieved from the IBM 5520 system with difficulty and poor time efficiency. There was approximately 80% agreement between clinician and pathologist in diagnosis of fibrinous pneumonia. There was no significant correlation between clinical

duration of the disease and histopathologic ageing of the lesion. The differences due to undefined criteria, variation in nomenclature, variability in sample selection and lack of ageing criteria were encountered.

4. Effects of Acid-forming Emissions on Livestock

Livestock producers and veterinarians have been concerned for many years about the potential effects of acid forming emissions from the sour gas industry on livestock. The effects, if they exist, are not well defined. Therefore a workshop was organized in November 1986 in conjunction with the Alberta Environmental Centre to accumulate most of the known information on the effects of acid gases from the petroleum producing industry upon livestock. The workshop entitled "Effects of Acid-forming Emissions in Livestock in Alberta". Dr. Byron Beck was the coordinator from the Animal Health Division. This workshop was very successful, bringing together industry, university and government personnel with private livestock producers and veterinary practitioners. There was a detailed review of both the scientific information and observations made by livestock owners and veterinarians in the field.

5. Development of Selenium Tests Panel

Selenium deficiency is a significant disease in the province of Alberta. A project was undertaken to upgrade the diagnostic capability of the toxicology laboratory for Selenium deficiency. Dr. Beck and the staff of the laboratory developed a range of capabilities including analysis for Selenium, Vitamin E, creatinine phosphokinase and glutathione peroxidase. These tests have proven to be useful in support of diagnostic submissions and research projects. The toxicology laboratory also has served as a reference for laboratories in other provinces and states.

6. Feedlot Selenium Study I

Some recent research evidence has suggested that trace minerals such as Selenium may play a part in maintenance of disease resistance in cattle. Therefore a project was undertaken to determine whether there were any problems with disease resistance and immunity associated with body Selenium stores of incoming feedlot animals. Dr. Fenton was the principal investigator and in conjunction with the toxicology laboratory had a large number of samples analyzed. To date, analysis is still in progress and the final results of the investigation are not yet available.

7. Feedlot Selenium Trial II

This is a large multi-disciplinary project also intended to study the role of Selenium in the immunity of feedlot cattle to infectious disease. Animals introduced to a feedlot are followed during the course of a feeding trial. The principal investigator is Dr. George Mathison of the University of Alberta, Animal Science Department. The Microbiology Department of the Western College of Veterinary Medicine, the Soil and Feed Testing lab of Alberta Agriculture and the Toxicology laboratory of Alberta Agriculture are also involved. Dr. Beck and staff of the Toxicology laboratory are determining the Selenium and trace mineral status of the test animals. These results will then be compared with an elaborate immunologic assay performed at W.C.V.M. in Saskatoon. This study is ongoing and results will be published by Dr. Mathison upon completion.

Avian Investigations

1. Evaluation of Vaccine Virus Shedding in ILT Vaccinated Pheasants

When the ASL type vaccine became unavailable, it became necessary to evaluate a possible replacement vaccine,

Intervet ILT. A project was initiated by Dr. Hanson to study vaccine virus shedding in vaccinated pheasants. A group of pheasants were obtained and were vaccinated according to the manufacturer's recommendations. In contact penmates were evaluated along with vaccinated birds. Severity of infection in vaccinated eyes and presence of reaction in penmates were evaluated. It was determined that there was no significant shedding in ringneck pheasant penmates.

2. Mortality Survey - Broiler Flocks

Poultry producers often are familiar enough with causes of illness in their birds to diagnose common diseases in their flocks. In cooperation with personnel of the poultry branch, an investigation was performed by Dr. Hanson to determine the accuracy of producer determination of causes of mortality in their flocks. Mortality from a sample of producers was examined and results of laboratory examinations compared with producer diagnoses based on clinical signs. In most cases, a good correlation was obtained.

3. Turkey Barn Misting

With the dry air in the province, especially in the

winter time, air in poultry barns can become extremely dusty. It is speculated this has an adverse effect on the respiratory tract and may lead to respiratory disease. A project was initiated by Dr. Hanson in cooperation with the poultry branch to determine if there would be beneficial effects associated with misting of a turkey barn to reduce the incidence of dust. A variety of parameters were examined including examination of all routine mortality with particular reference to the respiratory system. In this trial misting appeared to reduce respiratory disease and associated mortality.

4. Alberta Breeder Flock Health Program

Salmonellosis is an important infection of birds. A provincial monitoring program has been in place for many years. In cooperation with the poultry branch environmental monitoring of all turkey breeder and chicken breeder flocks was continued. Particular emphasis was placed on the incidence of Salmonellae contamination of the environment. Cull chicks and hatchery residue (fluff) were also routinely examined. When isolations were identified, hatcheries and flock owners were advised of prevention and control

procedures. This program continues to be an effective disease prevention and control measure.

5. Hatchery Sanitation Monitoring Project

The importance of monitoring hatchery sanitation has long been recognized. The use of Rodac plates to allow hatchery managers to monitor their own sanitation standards and procedures was expanded. Additional assistance was offered by Dr. Hanson to those hatcheries which had begun this procedure earlier. This project continued to promote good hatchery sanitation as a prime method of disease prevention.

6. The Role of Low Humidity Incubation in the Development of Chick Nephropathy Syndrome

A disease syndrome known as visceral gout/nephropathy is a continuing cause of baby chick mortality. A research project was initiated to determine if the visceral gout syndrome/nephropathy seen in baby chicks could be initiated by low humidity incubation. Normal humidity levels were maintained for variable periods throughout the incubation cycle with humidity dropped following these periods. While the nephropathy syndrome could be reproduced, results were inconsistent, and other factors may be involved.

7. Feeding Trials to Determine Palatability and Decreased Egg Production

Feed is often suspected by producers as the cause of egg production decrease. Accordingly, a number of trials were conducted in which chickens and turkeys were placed on suspect feed and control feed to evaluate feed problems identified from laboratory submissions. In several instances, palatability was initially thought to be a factor although this was not substantiated. In other instances feed was demonstrated not to be responsible for decreased egg production. These studies were undertaken by Drs. Hanson and Onderka as identified from diagnostic submissions.

8. Mycobacteriosis in Ringnecked Doves

Mycobacteriosis is a common problem in small farm flocks and certain categories of pet birds. This can be a difficult disease to control when multiple ages of birds are present on the same premises. Submissions of Ringnecked Doves from a private aviary revealed Mycobacteriosis to be a serious problem in this flock. Dr. Crowe conducted an investigation and developed a Mycobacteriosis control program in conjunction with the

owner. Suggestions made included early segregation of young birds, establishment of a noninfected flock and improvements in sanitation. The potential risks to human health were also discussed with the owner. This project resulted in a significant reduction of Mycobacteriosis in this flock. It is hoped that the owner may eventually be able to eradicate the disease from the flock.

Wildlife Investigations

1. Cyanide Marker and Detection

The provincial government has embarked upon a program using markers in pesticides. This is necessary to identify whether government pesticides are affecting nontarget species and, when nontarget species are victims of pesticides to assist in identifying the source. Cyanide is used by Department of Agriculture Pest Control officers. Dr. Roy Smith of the Toxicology laboratory developed a new, simple and extremely rapid technique to detect cyanide in animal tissues. Cyanide used by the Department of Agriculture is now marked with a blue dye and the finding of both cyanide and the dye identify the source of the pesticide. This test

has proven very useful when cases of cyanide poisoning are encountered in livestock.

2. Hatchability Problems in Canadian Wildlife Service Peregrine Rearing Facility

A problem was encountered with hatchability among Peregrine Falcons in a federal rearing facility. Dr. Onderka conducted an investigation of this problem. An examination of the unhatched and residue from hatched eggs revealed infertility and weak germinal discs. This was associated with certain breeding pairs and likely due to insufficient insemination. Middle to late embryonic mortality was most often associated with drowning due to insufficient fluid loss during incubation. Perinatal losses of weak chicks were interpreted as marginal nutrient deficiencies. Corrective measures were implemented including Vitamin supplementation of breeding Peregrine Falcon pairs. Follow-up studies have demonstrated a great improvement in hatchability.

3. Study of Enteric Reovirus in Pheasant Poults

The Brooks Wildlife Centre is a provincial pheasant rearing facility. For a number of years a syndrome of

diarrhea has been noted in pheasants during the first week of life. To investigate this problem, Dr. Onderka collaborated in a study with Dr. Keith McMillan, a private poultry veterinarian. A Reovirus was found to be associated with the diarrheic condition. Intestinal contents from dead or sick pheasant poults containing Reovirus particles were inoculated orally into 250 three day old pheasant poults. A control group was held at a different laboratory. Some of the inoculated poults died showing cecae distended with bubbly yellow fluid in which Reo and Corona virus particles were demonstrated. However, these viruses were also found in clinically normal birds and in some birds of the control group. Therefore the significance of the presence of these viruses in cases of enteritis remains uncertain and the cause of the illness at the Brooks Wildlife Centre remains unknown.

4. Selenium/Glutathione Peroxidase in Bighorn Sheep

Literature suggests that there is an inverse relationship between Selenium and Glutathione Peroxidase in Mountain Goats. This has been interpreted to indicate that goats had evolved in Selenium deficient areas and did not require as much Selenium as other species. A study was conducted by

Dr. Onderka in conjunction with Bill Wishart of Fish and Wildlife to determine whether a relationship exists between Selenium levels and Glutathione Peroxidase activity in Bighorn Sheep. This study found a direct relationship between the levels of Selenium and Glutathione. Selenium and Glutathione Peroxidase levels tended to be similar in animals within the same herd but to vary between herds. It was concluded that the adverse relationship between Selenium and Glutathione Peroxidase that exists in Mountain Goats does not exist in Bighorn Sheep. The mechanism of resistance of Bighorn Sheep to Selenium deficiency was not identified.

5. Plasma Cortisol Project

In order to conduct the ongoing studies with Bighorn Mountain Sheep a test for Plasma Cortisol was required. Dr. Onderka investigated and adapted a Plasma Cortisol test for humans in Bighorn Sheep. The result was a test that provides accurate and sensitive levels of Plasma Cortisol in the sheep.

Toxicology Investigations

1. Pesticide Toxicity in Southern Alberta

Following aerial application of pesticides to control grasshoppers and aphids complaints were received from three livestock producers. In each case the producer suspected that there were toxic effects of the pesticide upon either themselves or their livestock. Dr. Harries initiated an investigation which involved the Animal Health Division, the Department of the Environment and the Environmental laboratory at Vegreville. The study indicated that aerial application was improper. It was however not possible to demonstrate a link between the suspected animal health problem and the aerial application of pesticides.

2. Analysis of Feed for Urea and Oxalates

A field investigation of improper addition of urea to feed revealed the need for a rapid test for urea and oxalate levels in feed. Dr. Roy Smith modified a number of techniques to achieve a more rapid identification. These techniques are performed on an automated instrument known as the Multistat III.

Subsequently both urea and oxalate levels in feed have been analyzed and in one case urea toxicosis was diagnosed in a herd of beef cattle by analyzing a newly added feed supplement. In this case the turnaround time of one hour resulted in a rapid diagnosis. Timely results assisted in compensation of the farmer by a feed company. Rapid testing in such cases will also allow feed companies to reduce or even eliminate losses resulting from mistakes in urea supplementation of feeds.

3. Identification of Hydrocarbons

A number of oil products are involved in the poisoning of farm livestock. One problem in identifying the origin of hydrocarbons in outbreaks of poisoning is the weathering process. This refers to the evaporation of the more volatile components of the oil. Dave Lewis of the Toxicology laboratory has developed a method for identifying crude oil, weathered crude oil, refined oil, weathered refined oil and crankcase oil. All of these are involved in poisoning animals. As a result of this project it is now possible to identify the origin of hydrocarbons encountered in animal poisonings and thereby pinpoint responsibility in such cases.

4. Renal Calcium Levels for Diagnosis of Ethylene Glycol Poisoning

Ethylene glycol which is a common component of antifreeze is a common cause of toxicity in a number of species. While ethylene glycol poisoning can be easily diagnosed by microscopic examination of the kidney in the late stages, it has proven very difficult to diagnose in the early stages. Dr. Roy Smith developed a method of calcium analysis of kidney to identify the presence of calcium oxalate, a metabolic breakdown product of ethylene glycol. This technique now allows the diagnosis of ethylene glycol poisoning even in those cases that have heretofore been difficult to diagnose using histopathological methods.

5. Anatoxin Detection

Anatoxin is one of the poisons that is produced by blue-green algae. Blue-green algae poisoning occurs in livestock during the summertime when certain types of algae bloom in ponds, lakes and sloughs. One problem that is encountered with diagnosis of algae poisoning is that the toxin is quite unstable. As a result water for toxin analysis collected a few days after the poisoning episode will not contain any toxin. Dr. Roy Smith has developed a technique for detecting the

breakdown products of anatoxin. This has now been used to permit identification of previously formed poison in water taken after an outbreak of algae poisoning.

6. Carbofuran Analysis

Carbofuran poisoning is becoming a common problem in cattle and pigs and can also poison dogs and other species by contamination of the feed or when used maliciously. Dr. Beck and staff of the Toxicology laboratory have developed a rapid test for the identification of carbofuran in stomach contents. This allows rapid diagnosis. The test is designed to detect only toxic amounts of the product in an animal's stomach and is not sufficiently sensitive to find very low levels of environmental contamination.

7. Zearalenone

Zearalenone is a Mycotoxin which causes clinical disease in pigs. It has been identified as a feed contaminant in Alberta, usually associated with imported feed such as corn and soybean. Dr. Beck and the staff of the Toxicology laboratory have now developed a test to detect clinically significant levels of Zearalenone in feeds. This test has

subsequently been used to identify Zearalenone in Alberta feeds.

8. Hormone Growth Promoters

Hormone implants are commonly used in growing cattle to increase the rate of gain. The veterinary literature is unclear about how much of the hormone implant remains in the animal following the withdrawal period. Dr. Smith is conducting a project analyzing Ralgro and Synovex implants recovered from the ears of slaughtered cattle to determine residue levels. This study is in its early stages however initial results suggest that animals may not be free of the implanted hormones at the end of the recommended withdrawal time.

Parasitology Investigations

Three new projects studying intestinal parasites in cattle were funded in April by Farming for the Future. The Combined funding permitted the hiring of a technician for five months to help with these projects.

1. Pembina Cow/Calf Survey of Parasites

In cooperation with a regional livestock specialist, and the Pembina Forage Pasture Association.

2. The Economic Value of Using Ivomectin in Yearling Steers

   In cooperation with a regional livestock specialist.

3. A Survey of Intestinal Parasites in Cattle in the Foothills Area West of Red Deer

   In cooperation with a regional livestock specialist.

These projects join the list of five other projects that will continue during the summer, and will involve other staff members:

1. Intestinal Parasite Survey in Cattle

   Conducted through the post mortem room and local abattoir.

2. The Economic Value of Using Ivomectin in a Cow/Calf Operation

   Conducted on an Alberta farm. In cooperation with a regional livestock specialist. This project was funded by MSD-AG VET.

3. Eyeworms in Cattle and Horses

   Conducted on post mortem room submissions.

4. Face Flies on Cattle

Rearing flies in the laboratory and studying their significance in transmitting eyeworms.

5. Specificity of Ectoparasites on Cattle

Conducted on post mortem submissions at the Fdmonton laboratory.

Other Investigations

1. Drug Interactions on an Isolated Sensory Neuron

The number of drugs used in veterinary practice are used simultaneously. Many of these drugs have activity on nervous tissue but the effects of combinations of drugs and drugs given simultaneously are not well understood. Dr. Nation has been granted an educational leave of absence to attend the University of Calgary and study the effects of veterinary drugs on the nervous function. A Ph.D. thesis will be written from this work which is anticipated to be completed in 1987.

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2. Hanson, J.A., A Summary of Prevalent Diseases of Alberta Poultry. 1st Annual Colburn-Dawes Feed Industry Conference Proceedings.

3. Onderka, D.K., Melatonin Implant Hair Growth Research Reported. Fur Rancher, January 1986.

4. Stone, M.W., The Effects of Environment on the Immune System of the Pig. Western Hog Journal, Winter 1986.

5. Stone, M.W., Pasteurella Pneumonia. Western Hog Journal, Spring 1986.

6. Stone, M.W., The New High Health Category on Alberta's Swine Herd Health Program. Camborough Comments, Spring 1986.

7. Stone, M.W., Exudate Epidermitis. Western Hog Journal, Fall 1986.

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2. Hanson, J.A. Trichomoniasis in Birds. Agri-fax, Agdex 663/34, June 1986.

3. Kennedy, M.T. Demodectic Mange in Cattle. Agri-fax, Agdex 663-34, June 1986.

4. Kennedy, M.J. and J.A. Hanson. Trichomoniasis in Birds. Agri-fax, Agdex 663-34, June 1986.

5. Kennedy, M.J. Tapeworms in Dogs. Agri-fax, Agdex 655-2, November 1986.

6. Kennedy, M.J. Eyeworm, Thelazia spp in Cattle of Alberta. Agri-fax, Agdex, October 1986.

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8. Kennedy, M.J. Synopsis of the Parasites of Vertebrates of Canada. Helminths and Protozoa of Terrestrial Mammals.

9. Kennedy, M.J. and R.A. Newman. Synopsis of the Parasites of Domesticated Mammals of Canada.

10. MacDonald, D.W. Laboratory Submission Manual for Alberta Veterinary Practitioners.

VIDEOS

1. Smith, R.A. The Determination of Metaldehyde in Diagnostic Samples, Chemical Markers Added to Bait Used by Provincial Pest Control Ofricers and a Soupcon of Miscellany.

CATTLE DISEASES

(Includes Edmonton, Airdrie, Fairview, Lethbridge)

DIAGNOSIS	
BLACKLEG	49
BLOAT	147
BOVINE VIRUS DIARRHEA	95
BRAXY	4
BRONCHITIS	42
CANDIDIASIS	2
CARDIAC FAILURE	50
CARDIOMYOPATHY	29
CELLULITIS	12
CHONDRODYSTROPHY	1
COCCIDIOSIS	43
COLD INJURY	2
COLITIS	30
CONJUNCTIVITIS	5
CYST	1
DEFICIENCY	
COPPER	8
MALNUTRITION	7
SELENIUM	22
VITAMIN A	11
VITAMIN E	7
ELECTROCUTION	2
EMACIATION	71
ENCEPHALITIS	
H SOMNUS	16
NONSUPPURATIVE	15
OTHER	4
SUPPURATIVE	9
ENCEPHALOPATHY OTHER	8
ENDOCARDITIS	24
ENDOMETRITIS	9

ENTERIC COLIBACILLOSIS	101
ENTERITIS	
CATARRHAL	3
CHRONIC	3
CLOSTRIDIUM SP	1
CRYPTOSPORIDIOSIS	5
FUNGAL	2
GRANULOMATOUS	2
HEMORRHAGE	14
NECROTIC	26
OTHER	57
PROTOZOA	12
SALMONELLA	16
VIRAL	85
ENTEROTOXEMIA	4
EOSINOPHILIC MYOSITIS	1
ESOPHAGITIS	1
EPIDIDYMITIS	1
EXPERIMENTAL	11
FAT COW SYNDROME	2
FAT NECROSIS	2
FIBROSIS	9
FOOT ROT	1
FRACTURE	6
GLOSSITIS	2
GOITRE	19
GRANULATION TISSUE	7
GRANULOMA	9
HEMATOMA	4
HEMORRHAGIC DIATHESIS	4
HEPATIC	
FIBROSIS	16
LIPIDOSIS	17
NECROSIS	21

HEPATITIS	
BACTERIAL	3
NECROTIC	2
TOXIN	2
UNKNOWN	10
HERNIA	1
HYDROENCEPHALUS	19
HYDRONEPHROSIS	1
HYPERKERATOSIS	1
HYPERKALEMIA	1
HYPERTHERMIA	2
HYPERPLASIA	
LYMPH NODE	2
THYROID	1
HYPOCALCEMIA	64
HYPOMAGNESEMIA	5
HYPOPHOSPHATEMIA	38
HYPOTHERMIA	4
INFECTIOUS BOVINE RHINOTRACHEITIS	
OTHER	5
RESPIRATORY	11
ICTERUS	3
IMPACTION	6
IMMUNODEFICIENCY	3
INFARCT	8
INTUSSUSCEPTION	3
JOHNES DISEASE	19
KETOSIS	1
KERATOCONJUNCTIVITIS	3
LARYNGITIS	14
LEPTOSPIROSIS	3
LEUKOENCEPHALOMALACIA	1
LEUKOSIS	
LYMPHOID	15
LIGHTINING STROKE	1

LISTERIOSIS	2
LYMPHADENITIS	7
MALIGNANT CATARRHAL FEVER	4
MALIGNANT EDEMA	10
MALIGNANT LYMPHOMA	1
MASTITIS	101
COLIFORM	101
MYCOPLASMA	1
STAPHYLOCOCCUS	263
STREPTOCOCCAL AGALACTIA	46
STREPTOCOCCAL NON AGALACTIA	248
YEASTS	6
MENINGITIS	
BACTERIAL	19
UNSPECIFIED	18
MENINGOENCEPHALITIS NONSUPPURATIVE	2
MENINGOENCEPHALITIS H. SOMNUS	41
MENINGOEN SUPPURATIVE	17
METRITIS	17
MYCOSIS	1
MYELOMALACIA	5
MYELITIS	2
MYOCARDITIS	83
MYOPATHY	
NUTRITIONAL	26
OTHER	37
MYOSITIS	22
NECROBACILLOSIS	3
NEO NATAL DIARRHEA	163
NEPHRITIS	
GLOMERULO	3
INTERSTITIAL	16
PYLEO	18
NEOPLASMS	104
NEPHROSCLEROSIS	2
NEPHROSIS	10

NO DIAGNOSIS	492
NO VISIBLE LESION	683
NORMAL TISSUE	19
OBSTRUCTION INTESTINAL	4
OMPHALOPHLEBITIS	87
ORCHITIS	1
OSTEOMYELITIS	1
PERICARDITIS	13
PERITONITIS	81
PLEURITIS	49
PNEUMONIA	
ATYPICAL INTERSTITIAL	17
BACTERIAL	4
BRONCHO	227
BOVINE RESPIRATORY SYNCTIAL VIRUS	3
CHRONIC NONRESOLVING	36
EMBOLIC	29
ENZOOTIC	3
FIBRINOUS	443
GANGRENOUS	2
GRANULOMATOUS	7
HEMOPHILUS	48
INHALATION	40
INTERSTITIAL	209
MYCOTIC	6
OTHER	141
PARASITIC	1
PASTEURELLA	372
SUPPURATIVE	41
VIRAL	8
POLIOENCEPHALOMALACIA	26
POLYSEROSITIS	4
PROLAPSE RECTUM	1
PULMONARY	
ATELECTASIS	10

PULMONARY (continued)	
EDEMA	101
EMPHYSEMA	3
FIBROSIS	4
PYOMETRA	1
RETICULITIS TRAUMATIC	7
RUMEN OVERLOAD	13
RUMENITIS	
MYCOTIC	7
OTHER	27
RUPTURE	
ABOMASUM	4
INTESTINE	1
MUSCLE	1
PULMONARY ARTERY	1
UTERUS	2
SARCOSPORIDIOSIS	2
SEPTICEMIA	
E COLI	37
OTHER	77
PASTEURELLA	4
PSEUDOMONAS	2
STAPHYLOCOCCUS	3
STREPTOCOCCAL	3
SPECIMEN UNSUITABLE	52
STARVATION	1
STILLBORN	49
STOMATITIS	
BOVINE PAPULAR	4
SYNOVITIS	1
TORSION	
ABOMASUM	5
INTESTINAL	11
MESENTERIC	7
TOXEMIA	6
TRACHEITIS	7

TRAUMA	46
TYPHLITIS	6
TUBERCULOSIS	1
ULCER ABOMASAL	59
UREMIA	3
URINARY CALCULI	5
VASCULAR THROMBOSIS	3
VEGETATIVE ENDOCARDITIS	3
WINTER DYSENTERY	2
TOTAL	10,208

PORCINE DISEASES

(Includes Edmonton, Airdrie, Fairview, Lethbridge)

DIAGNOSIS	
ABORTION, LEPTOSPIRA SPP.	1
ABORTION, MUMIFIED FETUS	10
ABORTION, SMEDI VIRUS	1
ANEMIA, IRON DEFICIENCY	8
ARTHRITIS, SUPPURATIVE	25
COCCIDIOSIS	3
EDEMA DISEASE	4
EMACIATION	6
ENDOCARDITIS, STREP SUIS TYPE II	7
ENTERITIS, CAMPYLOBACTER	17
ENTERITIS, ESCHERICHIA COLI	175
ENTERITIS, NECROTIZING (PSEUDOMEMB.)	15
ENTERITIS, SALMONELLA SPP.	1
EPIDERMITIS, PORCINE, EXUDATIVE	15
HAEMOPHILUS PLEUROPNEUMONIA	18
LEPTOSPIROSIS	20
MALIGNANT HYPERTHERMIA	9
MENINGOENCEPHALITIS, NON-SUPPARATIVE	9
MENINGOENCEPHALITIS, SUPPURATIVE	19
METRITIS/MASTITIS, AGALACTIA (M.M.A.)	1
MISCELLANEOUS NEOPLASMS	4

MULBERRY HEART	6
MYOPATHY, NUTRITIONAL	2
NEPHRITIS, INTERSTITIAL	2
OMPHALOPHLEBITIS/OMPHALITIS	2
OSTEODYSTROPHY, OTHER	1
PNEUMONIA, ENZOOTIC	43
PNEUMONIA, PASTEURELLA HEMOLYTICA	1
PNEUMONIA, PASTEURELLA MULTOCIDA	59
RHINITIS, ATROPHIC, SWINE, OTHER	4
RHINITIS, SWINE, INCLUSION BODY	5
SEPTICEMIA, ACTINOBACILLUS SUIS	2
SEPTICEMIA, ESCHERICHIA COLI	18
SWINE DYSENTRY	23
ULCER, GASTRIC	20

OVINE AND CAPRINE DISEASES

(Includes Edmonton, Airdrie, Fairview, Lethbridge)

DIAGNOSIS	
ABOMASITIS, ULCERATIVE	1
ABORTION, CAMPYLOBACCER FETUS	4
ABORTION, CHLAMYDIA	9
ABORTION, MUMIFIED FETUS	9
ACIDOSIS, LACTIC (GRAIN OVERLOAD)	15
ARTHRITIS, SUPPURATIVE	4
BRAXI, CLOSTRIDIUM SEPTICUM	2
COCCIDIOSIS	17
COPPER DEFICIENCY	1
EMACIATION	13
ENTERITIS, ESCHERICHIA COLI	13
ENTERITIS, NECROTIZING (PSEUDOMEMB.)	2
ENTERITIS, SALMONELLA SPP.	1
ENTEROTOX, C.PERF. TYPE B LAMB DYSENTERY	1
ENTEROTOX, C.PERF, TYPE D PULPY KIDNEY	3
EPIDYDIMITIS, OTHER	1
GOITRE,DEFIENCY, IODINE	9
JOHNE'S DISEASE	4
LISTERIOSIS, LISTERIA MONOCYTOGENES	9
LITHIASIS, URINARY	4
LYMPHADENITIS, CASEOUS, C. PSEUDOTB.	18
MAEDI/VISNA	1

MALIGNANT EDEMA, D. SEPTICUM	1
MASTITIS, STAPHYLOCOCCUS AUREUS	4
MENINGOENCEPHALITIS, NON-SUPPURATIVE	4
MENINGOENCEPHALITIS, SUPPURATIVE	14
MYOPATHY, NUTRITIONAL	2
NECROBACILLOSIS, F. NECROPHORUM	1
NEMATODIASIS	5
NEPHRITIS, GLOMERULAR	2
OMPHALOPHLEBITIS/OMPHALITIS	2
OSTEODYSTROPHY, OTHER	3
PNEUMONIA, PASTEURELLA HAEMOLYTICA	10
PNEUMONIA, PASTEURELLA MULTOCIDA	12
POLIOENCEPHALOMALACIA	3
PREGNANCY TOXEMIA	6
RUMENITIS, MYCOTIC	1
TOXICOSIS, COPPER	1
TYMPANY (=BLOAT)	10
WHITE MUSCLE DISEASE	12

CHICKEN DISEASES

(Includes Edmonton, Airdrie, Fairview & Lethbridge)

DIAGNOSIS	
ACARIASIS	2
ASCARIDIASIS	13
AIR SACCULITIS	4
ANEMIA	1
ARTHRITIS	
BACTERIAL	13
STAPHYLOCOCCUS	39
ASCITES	159
ASPERGILLOSIS	13
ASPHXIATION	10
BUMBLEFOOT	2
CANDIDIASIS	4
CANNIBALISM	17
CAPILLARIASIS	4
CARDIAC FAILURE	9
CELLULITIS	2
COCCIDIOSIS	
UNDIFFERENTIATED	37
COLIGRANULOMA	4
DEFICIENCY	
MALNUTRITION	3
STARVATION	1
VITAMIN A	6
DEHYDRATION	13
DERMATITIS	
BACTERIAL	6
GANGRENOUS	2
NUTRITIONAL	6
EGG PRODUCTION LOSS	3
EGG QUALITY PROBLEM	7

EMACIATION	6
ENCEPHALITIS	
AVIAN	3
ENCEPHALOMALACIA	2
ENTERITIS	
CATARRHAL	2
NECROTIC	48
ULCERATIVE	3
OTHER	8
FATTY LIVER SYNDROME	29
FERTILITY PROBLEM	2
FLEAS	1
FOWL CHOLERA	12
GIZZARD EROSION	4
GOUT	14
HATCHING PROBLEM	6
HEPATITIS	
INCLUSION BODY	9
UNIDENTIFIED	29
IMPACT	
BOWEL	10
INFECTIOUS	
BRONCHITIS	7
BURSAL DISEASE	11
CORYZA	3
LARYNGOTRACHEITIS	4
INJURY	16
KERATOCONJUNCTIVITIS	10
KINKY BACK	10
LAB EXAMS NEGATIVE	50
LEG WEAKNESS	100
LEUKOSIS	
LYMPHOID	17
UNDIFFERENTIATED	3
LISTERIOSIS	1
MALABSORPTION SYNDROME	6

MAREKS DISEASE	36
MISCELLANEOUS CONDITIONS	279
MISMANAGEMENT	36
MYCOPLASMOSIS	
M. GALLISEPTICUM	4
M. SYNOVIAE	16
UNIDENFIFIED	3
NEOPLASMS	11
NEPHRITIS	13
NO DIAGNOSIS	127
NORMAL TISSUE	31
OMPHALITIS	80
OSTEOCHONDRODYSTROPHY	29
OSTEOMYELITIS	9
OSTEOPOROSIS	17
PARASITES	
MISCELLANEOUS	2
PEDICULOSIS	5
PERITONITIS	42
REPRODUCTIVE DISORDER	19
RESPIRATORY DISEASE	
MISCELLANEOUS	9
RICKETS	14
ROUND HEART DISEASE	3
RUPTURE	
TENDON	14
SALMONELLOSIS	
SEPTICEMIA	
E COLI	42
STAPHYLOCOCCUS	14
STREPTOCOCCAL	1
UNKNOWN	4
STARVE OUT	10
SUDDEN DEATH SYNDROME	135
TOXICOSIS	5

TUBERCULOSIS	28
TUMORS	
MISCELLANEOUS	8
VACCINATION REACTION (Newcastle)	1
TOTAL	1853

TURKEY DISEASES

(Airdrie, Fairview and Lethbridge included)

AIR SACCULITIS	18
ANEURYSM	4
ARTHRITIS	
E COLI	3
OTHER	2
STAPHYLOCOCCAL	16
ASCITES	25
ASCARIASIS	2
ASPERGILLOSIS	26
COCCIDIOSIS	6
CANNIBALISM	1
COCCIDIOSIS	6
DEFICIENCY	
VITAMIN A	4
DEHYDRATION	23
DERMATITIS	4
EMACIATION	2
ENTERITIS	
CATARRHAL	2
HEMORRHAGIC	11
TRANSMISSIBLE	5
ULCERATIVE	2
ERYSIPELAS	5
FOWL CHOLERA	1
GIZZARD	
EROSION	6
IMPACTION	10
GOUT	6
HEPATITIS	3
HISTOMONIASIS	19
INJURY	14

LEG WEAKNESS	34
LITTER EATING	6
MISMANAGEMENT	14
MISCELLANEOUS CONDITIONS	169
MYCO ASPERGILLUS SP	26
MYCOPLASMA SP	4
NEOPLASMS	2
NEPHROSIS	1
NO DIAGNOSIS	16
NO VISIBLE LESION	11
OMPHALITIS	27
OSTEODYSTROPHY	3
OSTEOMYELITIS	2
OSTEOPOROSIS	2
PEDICULOSIS	1
PERIRENAL HEMORRHAGE	40
PERITONITIS	5
REPRODUCTIVE DISORDERS	5
RESPIRATORY DISEASE	
MISCELLANEOUS	8
RICKETS	12
ROUNDHEART DISEASE	30
SALMONELLOSIS	
ARIZONAE	1
PARATYPHOIDS	13
SEPTICEMIA	
E COLI	68
STAPHYLOCOCCAL	2
STARVE OUT	34
TOXICITY	5
TUBERCULOSIS	2
TOTAL	769

EQUINE DISEASES

(Includes Edmonton, Airdrie, Fairview, Lethbridge)

DIAGNOSIS	
ABORTION, E.V.R.	4
ABORTION, IDIOPATHIC	48
ABORTION, OTHER	13
ACTINOBACILLOSISIS, A. EQUULI	10
ARTERITIS, EQUINE, VIRAL	1
ARTERITIS, VERMINOUS	4
ARTHRITIS, SUPPURATIVE	3
CESTODIASIS	1
ENTERITIS, NECROTIZING (PSEUDOMEMB)	1
ENTERITIS, SALMONELLA SPP.	3
GASTRO-INTESTINAL ACCIDENT	3
GOITRE, DEFICIENCY, IODINE	4
MALIGNANT EDEMA, CLOSTRIDIUM	1
MENINGOENCEPHALITIS, SUPPURATIVE	3
METRITIS	1
NEMATODIASIS	5
NEPHRITIS, GLOMERULAR	3
OMPHALOPHLEBITIS/OMPHALITIS	2
PNEUMONIA, INTERSTITIAL	2
SEPTICEMIA, IDIOPATHIC	2
STRANGLES, STREPTOCOCCUS EQUI	2
TOXICOSIS, OTHER	2

CANINE DISEASES

(Includes Edmonton, Airdrie, Fairview, Lethbridge)

DIAGNOSIS	
ABORTION	
BACTERIAL	1
IDIOPATHIC	1
OTHER - INFECTIOUS UDO	2
ABSCESS	2
AMYLOIDOSIS	2
ANAESTHETIC DEATH	5
ANEMIA	
HEMOLYTIC	2
HEMORRHAGIC	5
OTHER	1
ANOMALY	
CARDIOVASCULAR	6
OTHER	4
ASPHYXIATION	2
BACTERIA	
STAPH AUREUS	3
STAPH INTERMEDIUS	2
STREP CANIS	1
STREP SP	1
STAPH SP	1
PSEUDOMONAS	1
PROTEUS	1
STAPH SP	2
STREP FAECALIS	1
E COLI	2
CALCINOSIS CIRCUMSCRIPTA	1
CARDIAC	
FAILURE	18
TAMPONADE	1
CARDIOMYOPATHY	8
CELLULITIS	2

CANINE DISEASES

(Includes Edmonton, Airdrie, Fairview, Lethbridge)

DIAGNOSIS	
COCCIDIOSIS	0
COLITIS	1
CONJUNCTIVITIS	1
CYST	
ADNEXAL	3
EPIDERMOID	8
ADNEXAL GLAND	1
HEMATOMA	1
DERMATITIS	31
ALLERGIC	2
ENDOCRINE	1
MYCOTIC	1
DISTEMPER	5
EMACIATION	6
ENCEPHALITIS	1
ENCEPHALOPATHY	1
ENDOCARDIOSIS	1
ENDOMETRITIS	1
ENTERITIS	
HEMORRHAGIC	5
NECROTIZING	6
PARVOVIRUS	38
NO DIAGNOSIS	4
CHRONIC	2
CATARRHAL	1
FOR CULTURE	115
FOR HEMATOLOGY	2
FOR IDENTIFICATION	9
FOR PARASITOLOGY	14

CANINE DISEASES

(Includes Edmonton, Airdrie, Fairview, Lethbridge)

DIAGNOSIS	
FOR TOXICOLOGY	55
FOR URINALYSIS	3
FOR VIROLOGY	2
FOR CYTOLOGY	1
GRANULATION TISSUE	5
GRANULOMA	6
GROWTH	
HYPERPLASIA	0
INFLAMMATION	6
GUNSHOT	2
HEMATOMA	1
HEPATIC LIPIDOSIS	1
HEPATITIS	5
HERNIA	
DIAPHRAGMATIC	1
HYDROCEPHALUS	1
HYPERKERATOSIS	2
HYPERPLASIA	
PROTATE	1
TONSIL	1
INFARCT	5
INFLAMMATION	
CHRONIC	11
ACUTE	1
INTESTINAL	
OBSTRUCTION	3

CANINE DISEASES

(Includes Edmonton, Airdrie, Fairview, Lethbridge)

DIAGNOSIS	
INTUSSUSCEPTION	2
LAB EXAMS NEG	75
LYMPHADENITIS	6
MALNUTRITION	8
MASTITIS	1
MENINGITIS	2
MENINGOENCEPHALITIS	
NON-SUPPURATIVE	2
SUPPURATIVE	1
MYOCARDITIS	2
NECROSIS	
FAT	1
NEPHRITIS	
INTERSTITIAL	2
GLOMERULO-INTERSTITIAL	1
OTHER	1
NEPHROSCLEROSIS	2
NEPHROSIS	2
NO DIAGNOSIS	56
NO VISIBLE LESION	21
NORMAL TISSUE	1
OBSTRUCTION	
ESOPHAGUS	1
ORCHITIS	1
OTITIS	
EXTERNAL	4

CANINE DISEASES

(Includes Edmonton, Airdrie, Fairview, Lethbridge)

DIAGNOSIS	
OMPHALITIS	1
PANCREATIC NECROSIS	8
PANCREATITIS	1
PERITONITIS	3
PLEURITIS	1
PNEUMONIA	
BRONCHO	5
FIBRIN	1
INTERSTITIAL	10
OTHER	1
SUPPURATIVE	4
INHALATION	2
PNEUMONITHORAX	1
POLIO	1
PULMONARY EDEMA	12
PULMONARY ATELECTASIS	1
PYOMETRA	1
RABIES NEGATIVE	24
SEPTICEMIA	3
STAPH AUREUS	2
PSEUDOMONAS	1
E COLI	1
OTHER	1
SPECIMEN UNSUITABLE	5
STILLBORN	2
TONSILITIS	1

CANINE DISEASES

(Includes Edmonton, Airdrie, Fairview, Lethbridge)

DIAGNOSIS	
TORSION	
MESENTERIC	3
STOMACH	7
SPLEEN	2
TRAUMA	12
TOXOPLASMOSIS	2
ULCER	
GASTRIC	1
URINARY CALCULI	8
UREMIA	3
VAGINITIS	
STREP CANIS	1
YEAST	1

FELINE DISEASES

(includes Edmonton, Airdrie, Fairview, Lethbridge)

DIAGNOSIS	
ABORTION	0
ABSCESS	1
AMYLOIDOSIS	1
ANESTHETIC DEATH	1
ANEMIA	
HEMORRHAGIC	1
OTHER	3
ANOMALY	1
BACTERIA	
KLEBSIELLA	1
STAPH AURFUS	1
CARDIAC FAILURE	5
CARDIOMYOPATHY	7
COLITIS	2
CYST	1
EPIDERMOID	2
CYSTITIS	3
DERMATITIS	10
DIABETES MELLITUS	1
EMACIATION	6
ENDOMETRITIS	1
ENTERITIS	4
FELINE UROLOGIC SYNDROME	1
FELINE INFECTIOUS PERITONITIS	9

FELINE DISEASES

(Includes Edmonton, Airdrie, Fairview, Lethbridge)

DIAGNOSIS	
FELINE LEUKEMIA	2
FELINE PANLEUKEMIA	23
FELINE RHINOTRACHEITIS	2
FIBROSIS	1
FOR CULTURE	34
FOR IDENTIFICATION	2
FOR PARASITOLOGY	1
FOR TOXICOLOGY	3
FOR VIROLOGY	2
GASTRITIS	1
GINGIVITIS	2
GRANULOMA	1
GROWTH INFLAMMATION	4
GUNSHOT	1
HERNIA	
DIAPHRAGMATIC	1
HEPATIC LIPIDOSIS	5
HEPATIC NECROSIS	1
HEPATITIS	2
HYDRONEPHROSIS	1
HYPERPLASIA	
LYMPH NODE	2
MAMMARY	2

FELINE DISEASES

(Includes Edmonton, Airdrie, Fairview, Lethbridge)

DIAGNOSIS	
INFLAMMATION	
ACUTE	1
CHRONIC	2
KERATITIS	1
LAB EXAMS NEGATIVE	19
MALNUTRITION	7
MENINGOENCEPHALITIS	1
NEPHRITIS	
GLOMERULO	1
INTERSTITIAL	2
NEPHROSIS	2
NO DIAGNOSIS	13
NO VISIBLE LESION	3
PERITONITIS	1
PLEURITIS	2
PNEUMONIA	
BRONCHO	4
INTERSTITIAL	5
SUPPURATIVE	1
PULMONARY EDEMA	6
RABIES NEGATIVE	19
SEPTICEMIA	1
P MULTOCIDA	1
TRAUMA	25
UREMIA	2
URETHRAL OBSTRUCTION	5

FELINE DISEASES

(Includes Edmonton, Airdrie, Fairview, Lethbridge)

DIAGNOSIS	
URINARY CALCULI	5

FUR-BEARING ANIMALS

(Airdrie, Fairview, and Lethbridge included)

DISEASE	CHINCHILLA	FERRET	MINK	RANCH FOX	RANCH MINK	RANCH LYNX
Aleutian Disease					3	
Alopecia	1			1		
Bacteria						
Clostridium perfringens		1				
Listeria monocytogenes					1	
Pseudomonas aeurginosa	1			1		
Staphylococcus aureus	1					
Bloat	1	1		2		
Cardiac Failure	1			1		
Cardiomyopathy	1			1		
Cellulitis	1					
Corneal Ulceration	1					
Cystitis				1		
Deficiency Starvation				3		
Dermatitis					1	
Emaciation		1		1	2	1
Encephalomalacia				1		
Endometritis					2	
Fatty Liver Syndrome						1
For Culture				1		
For Identification			1	1		
For Serology					1	
Fracture				1		
Gastric Ulcer					1	
Hepatic Lipidosis				1		
Hyperthermia				1		

FUR-BEARING ANIMALS

(Airdrie, Fairview, and Lethbridge included)

DISEASE	CHINCHILLA	FERRET	MINK	RANCH FOX	RANCH MINK	RANCH LYNX
Hypothermia	1					
Infertility					5	
Malocclusion	1					
Negative Lab Exam		1	4	1	1	
Neoplasm:						
Hemangiosarcoma					1	
Lymphosarcoma					1	
Nephritis				1	1	
Interstitial					1	
No Diagnosis		1		3		
Normal Tissue				3		
No Test	1			1		
No Visible Lesion				6	1	
Otitis				1		
Parasitism: See Table						
Pneumonia						
Bacterial					1	
Interstitial				1		
Supperative				1		
Other	1					
Pulmonary Edema					1	
Prostatitis				1		
Rabies Negative			1			
Septicemia						
Klebsiella				1		
Listeria monocytogenes	1					
Stillborn				1		
Stress					1	

FUR-BEARING ANIMALS

(Airdrie, Fairview, and Lethbridge included)

DISEASE	CHINCHILLA	FERRET	MINK	RANCH FOX	RANCH MINK	RANCH LYNX
Thyroid Displasia				1		
Trauma	1		1	3		
Urethral Obstruction				2	1	
Urinary Calculi					1	
Vaginitis	1				1	
TOTAL	15	5	7	44	28	2

FISH DISEASES

Abscess	1
Aeromonas hydrophila	3
Blue Sac	1
Congenital Defect	1
Dermatitis	5
Enteritis	1
Experimental	73
F Bact Kidney Disease	4
For Culture	15
For Identification	4
For Toxicology	9
Gill Hyperplasia	3
Granuloma	2
Hepatitis	2
Lab Exams Negative	74
Meningitis	1
Miscellaneous Lab Findings	
Digestive	1
Respiratory	4
Myositis	4
Necrosis	2
Neoplasm	
Lymphoma	1
Lymphosarcoma	1
Other	1
Sarcoma	1
Squamous Cell Carcinoma	1
Thymoma	1
Nephrocalcinosis	13
Nephrosis	1
No diagnosis	3
No test	1

FISH DISEASES CONTINUED

Parasitism	
Cestode	5
Contracecum	1
Fluke	1
Glugea	1
Henneguya	1
Other	2
Pericarditis	1
Peritonitis	6
Septicemia	1
Specimen Unsuitable	22
Suitable Animals	12
Summerkill	1
Trauma	3
Tuberculosis	1

WILDLIFE DISEASES

ABORTION IATROGENIC	1
ABSCESS	
LARYNX	1
LEG	1
LIVER	1
OTHER	1
SKIN	1
SUBMANDIBULAR LYMPH NODE	1
THORACIC CAVITY	1
ANEMIA HEMORRHAGE	1
ARTHRITIS	
CHRONIC	1
BACTERIA	
PASTEURELLA HAEMOLYTICA	2
CAPTURE MYOPATHY	1
CARDIAC FAILURE	2
CARDIOMYOPATHY	1
CELLULITIS	1
CONTAGIOUS ECTHYMA	1
DEFICIENCY	
MALNUTRITION	1
THIAMINE	1
DERMATITIS	7
EMACIATION	6
ENCEPHALOMALACIA	1
EXPERIMENTAL	40
FOR ANALYSIS	11
FOR CULTURE	17
FOR IDENTIFICATION	52
FOR MEAT HYGIENE	4
FOR SEROLOGY	4
FOR TOXICOLOGY	3
STRYCHNINE	2

FRACTURE	6
GUNSHOT	1
HEPATITIS	
BACTERIAL	1
PARASITIC	1
OTHER	2
HYPERPLASIA	1
MISCELLANEOUS LABORATORY FINDINGS	
DIGESTIVE	1
MYOPATHY	1
NEGATIVE LABORATORY EXAMINATION	53
NEOPLASM	
FIBROMA	2
PAPILLOMA	3
LYMPHOSARCOMA	1
NEPHROSIS	1
NO DIAGNOSIS	12
NO VISIBLE LESION	9
NORMAL TISSUE	6
OPHTHALMITIS	1
PNEUMONIA	
BACTERIAL	2
BRONCHO	1
FIBRINOUS	1
INHALATION	1
PARASITIC	4
SUPPURATIVE	2
PULMONARY EDEMA	2
RABIES NEGATIVE	18
SEPTICEMIA	
SALMONELLA	1
STAPHYLOCOCCUS	1
SPECIMEN UNSUITABLE	4

TOXICOSIS	
STRYCHNINE	1
CYANIDE	1
TRAUMA	23
TOTAL	331

RABIES SUMMARY

1986

SPECIES	LOCATION		NUMBER POSITIVE	DATE CONFIRMED
Skunk	Co. of Newell		1	January 3
Bat	Co. of Newell		1	June 10
Bat	Co. of Newell		1	July 8
Bat	Co. of Newell		1	July 17
Bat	Co. of Newell		1	July 31
Bat	Co. of Warner		1	September 24
	TOTALS	SKUNKS	1	
		BATS	5	
			6	

MISCELLANEOUS BIRDS

(Airdrie, Fairview, Lethbridge included)

ACARIASIS	5
AIR SACCULITIS	13
AMYLOIDOSIS	3
ANEMIA	5
ARTHRITIS	
STAPHYLOCOCCAL	8
UNIDENTIFIED	2
ASCARIDIASIS	1
ASPERGILLOSIS	12
BOTULISM	2
BRONCHITIS	2
CANDIDIASIS	17
CAPILLARIASIS	1
CHLAMYDIOSIS	22
COCCIDIOSIS	4
COLIBACILLOSIS	2
COLIGRANULOMA	1
CONJUNCTIVITIS	2
DERMATITIS	
UNDETERMINED	3
ENCEPHALOMALACIA	3
ENTERITIS	
UNIDENTIFIED	4
FATTY LIVER SYNDROME	4
GIZZARD EROSION	2
GOUT	5
HEPATITIS	
OTHER	38
HISTOMONIASIS	1
IMPACTION	5
INFECTIOUS LARYNGOTRACHEITIS	4
MANAGEMENT FACTORS	37

MISCELLANEOUS CONDITIONS	224
NEOPLASMS	
MAREKS DISEASE	1
OTHER	1
NEPRHOSIS	11
OMPHALITIS	5
OSTEOMYELITIS	2
OSTEOPOROSIS	1
PASTEURELLOSIS	
P. ANATIPESTIFER	2
P. MULTOCIDA	2
PEDICULOSIS	2
PERITONITIS	7
POX	2
PSEUDOMONAS INFECTION	1
REPRODUCTIVE DISORDERS	12
RESPIRATORY CONDITIONS	16
RICKETS	2
SALMONELLOSIS	
ARIZONAE	1
PARATYPHOIDS	19
SINUSITIS	5
STAPHYLOCOCCOSIS	7
STREPTOCOCCOSIS	1
TOXICOSIS	
MISCELLANEOUS	10
TRICHOMONIASIS	4
TUBERCULOSIS	9
VITAMIN A DEFICIENCY	3
TOTAL	558

FETAL EXAMINATIONS

(Fairview, Airdrie, & Lethbridge Laboratories included)

Disease	Bovine	Porcine	Ovine	Equine
BACTERIAL				
Bacillus	21	1	-	-
Brucella	-	-	-	-
Coliforms	13	1	2	-
Corynebacterium	45	-	-	-
Hemophilus	1	-	-	-
Listeria	12	-	-	-
Streptococcus	10	3	1	-
Campylobacter	-	-	-	-
Staphylococcus	5	-	-	-
Bacterial (U.D.O.)	63	3	5	2
Leptospirosis	2	1	-	-
Other #1	21	-	3	4
VIRAL				
B.V.D.	7 (6)	-	-	-
E.A.E.	-	-	1 (1)	-
E.V.R.	-	-	-	3 (3)
I.B.R.	41 (27)	-	-	-
P.I.3	1 (1)	1 (1)	-	-
SMEDI	-	1 (1)	-	-
VIRAL (U.D.O.)	10 (7)	-	-	-
MYCOTIC				
Aspergillus	11	-	-	-
Mucor	3	-	-	-
Mycotic (U.D.O.)	17	1	-	-
Abortion Infectious (U.D.O.)	57	1	-	1
Other #2	1	-	-	-
NUTRITIONAL				
Iodine Deficiency	-	-	3	-
Malnutrition	1	-	3	-
Selenium Deficiency	-	-	-	-
Vitamin Deficiency	-	-	-	-

FETAL EXAMINATIONS

(Fairview, Airdrie, & Lethbridge Laboratories included)

Disease	Bovine	Porcine	Ovine	Equine
CONGENITAL DEFECT				
Alimentary System	3	-	-	-
Blood & Immune System	2	-	-	-
Cardiovascular System	37	-	-	3
Eyes & Ears	-	-	-	1
Musculoskeletal System	22	1	-	-
Nervous System	13	1	-	-
Skin, Appendages & Connective Tissues	2	-	-	-
Urogenital Tract	2	-	-	1
Multiple, Metabolic & Other Defects	33	1	1	3
MISCELLANEOUS				
Twinning	20	-	-	3
Dystocia	65	10	1	10
Mummified	35	3	1	-
Specimen Unsuitable	12	-	3	1
Trauma	3	-	-	1
For Identification	4	1	-	-
Other #3	18	6	1	9
Stillborn	14	2	-	2
NO DIAGNOSIS	445	42	26	48
TOTAL SPECIES	1072	82	51	92

GRAND TOTAL OF ALL SPECIES 1297

FETAL EXAMINATIONS (Continued)

Edmonton Lab Only:

Examinations done for diagnosis of reproductive dysgenesis and disease:

Urine Samples	170
Referrals from other labs	57
Blood Tests	580
Semen Evaluations	37
Biopsies	7
Genital Examinations	
Cervical Mucus	278

* Numbers in parenthesis indicates either herd or flock

FETAL EXAMINATIONS (Continued)

#1 Mixed Infection
Actinobacillus
Enterobacter

#2 Placentitis

#3 Placentitis
Orchitis
Stress
Metritis
Cyst
Granulosa Theca Cell Tumor
Chronic Testicular Abscess
Abruptio Placentae
Infertility
Torsion Umbilical Cord
Purulent Endometritis
Amnionitis

The increase in the equine laboratory testing was due to an increase in clinical cases and abortion due to Equine Viral Arteritis. There was an outbreak with a large number of abortions in one brood mare band from which virus isolation confirmed the cause. Many of the blood samples were sent to the laboratory of which 84 of 169 were done here and the remainder were forwarded to a private laboratory for testing.

There was an increase in Leptospirosis examinations which would suggest a possible increase in the incidence of Leptospirosis. However, although there has been an increased awareness of Leptospirosis on the basis of improved laboratory testing there has not been an appreciable increase in clinical cases.

The large numbers of laboratory examinations was due to serological evidence of Leptospira icterohemorrhagica in the Alberta Swine Artificial Insemination Unit in 1986 resulting in suspension of semen sales. By monitoring all boars in the unit by culture and FAT we were unable to demonstrate the presence of active infection. Since only suspicious serological evidence of infections existed, the quarantine was lifted and semen sales resumed.

Monitoring of Leptospirosis from field cases did not substantiate an increase in clinical evidence of Lepto.

There was an increase in submissions from private bull studs which reflected a greater role for the reproduction section in assisting the marketing of semen. A sale was made to the U.S. in which an individual state had a number of regulations. In such a situation in which state but not federal regulations apply, the services of Agriculture Canada laboratories are not available. The involvement of the reproduction secton expedited the testing and hence the sale of semen in this situation.

PARASITES

(Airdrie, Edmonton, Fairview and Lethbridge Labs)

	BOVINE	OVINE	EQUINE	PORCINE	CAPRINE	CANINE
PROTOZOA						
COCCIDIA	78	19	1	2	6	3
CRYPTOSPORIDIUM	4					
GIARDIA						1
CESTODES						
MONIEZIA	10					
TAPEWORMS			5			1
NEMATODES						
ASCARIDS				6		
DICTYOCAULUS	17					
HEMONCHUS		1				
NEMATODIRUS	12	5				
OSTERTAGIA	3	5				
PARASCARIS EQUORUM			6			
STRONGYLES	105	10	49	2	3	2
TOXOCARA/TOXASCARI						1
TRICHURIS	6	2				
ARTHROPODS						
LICE	8				1	
CHORIOPTES	1					
SARCOPTES	1					1
MIXED INFECTION	89	5	14	11	4	3
OTHER	2		3	1		1
TOTAL	336	77	78	22	14	13

PARASITES

(Continued)

(Airdrie, Edmonton, Fairview and Lethbridge labs)

	FELINE	LAB ANIMALS	RABBIT	POULTRY	OTHER
PROTOZOA					
COCCIDIA			7	23	12
ENTAMOEBA					1
GIARDIA					4
TRICHOMONAS					4
CESTODES					
CYSTICERCUS					3
TAPEWORMS	1	1	1		7
NEMATODES					
ASCARIDS				5	2
CAPILLARIA					2
DICTYOCAULUS					1
HETERAKIS GALLINAE				1	
SYPHACIA/ASPICULARIS		2			
TOXOCARA/TOXASCARIS					5
TRICHOSTRONGYLES					2
ARTHROPODS					
CHORIOPTES					1
LICE				2	
MITES	1		2	2	2
TICKS			1		2
MIXED INFECTIONS				3	
OTHER	1		1	1	60
TOTAL	3	3	12	37	108

PARASITOLOGY

The parasitology section examined 475 large animal submissions in 1986. The percent of the total number of large animal submissions is portrayed graphically in Figure 1 by month and large animal species.

During the year, 223 of the 293 (76.1%) bovine samples were tested for coccidia. The results are plotted according to the number of oocysts per gram of feces (opg) in Figure 2. Eighty percent of the submissions were negative for coccidia. Only 4.5% (10/223) of the total number of submissions (22.2% (10/45) of the positive cases) contained greater than 1000 opg. There is still no consensus on the significance of opg counts in cattle. Some reports demonstrate clinical signs in cattle passing greater than or equal to 5000 opg. When coccidiosis is diagnosed in our laboratory, the number of oocysts per gram of feces shed is usually in excess of 1000.

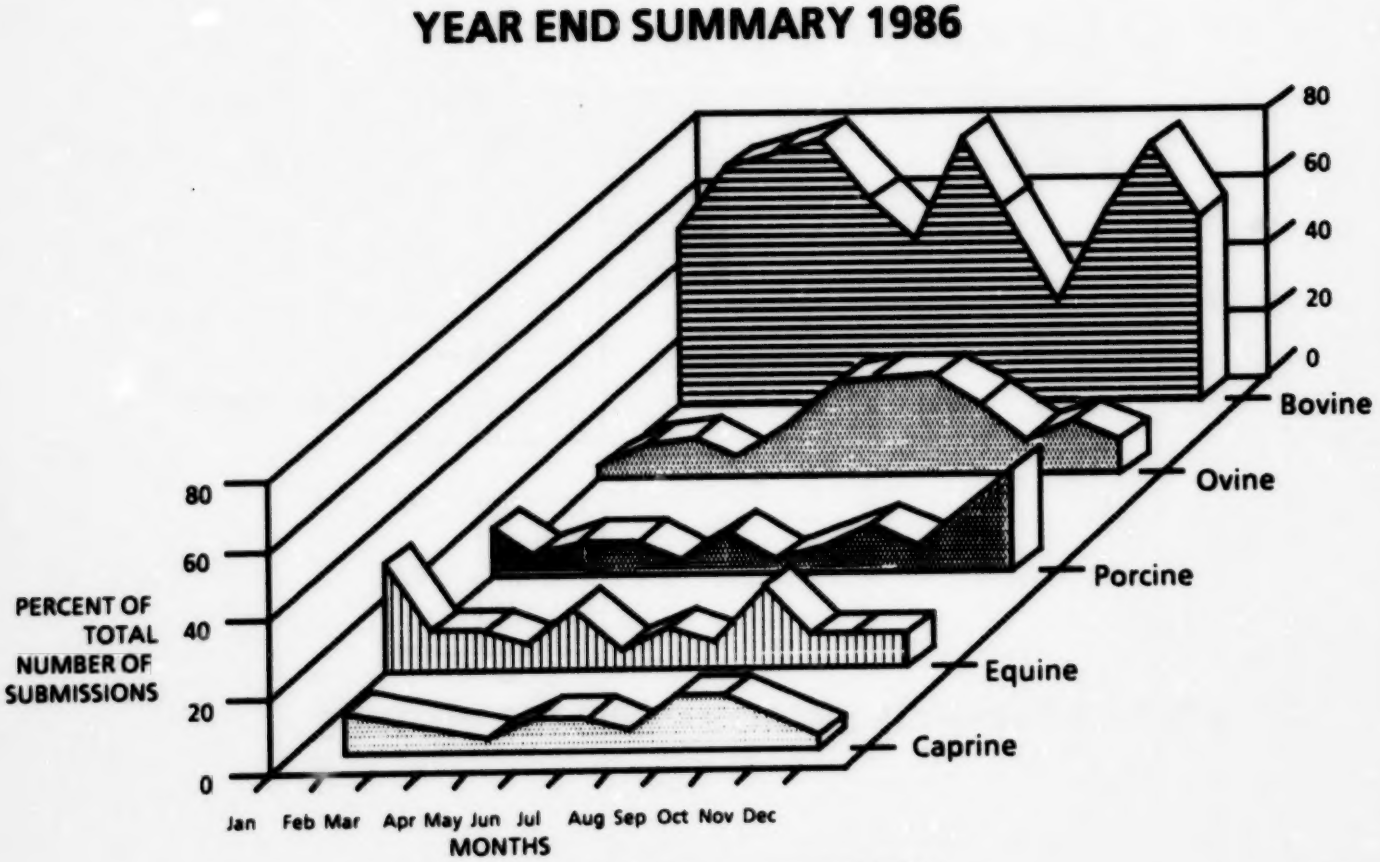

Figure 1. A comparison of percent of large animal submissions by month and species.

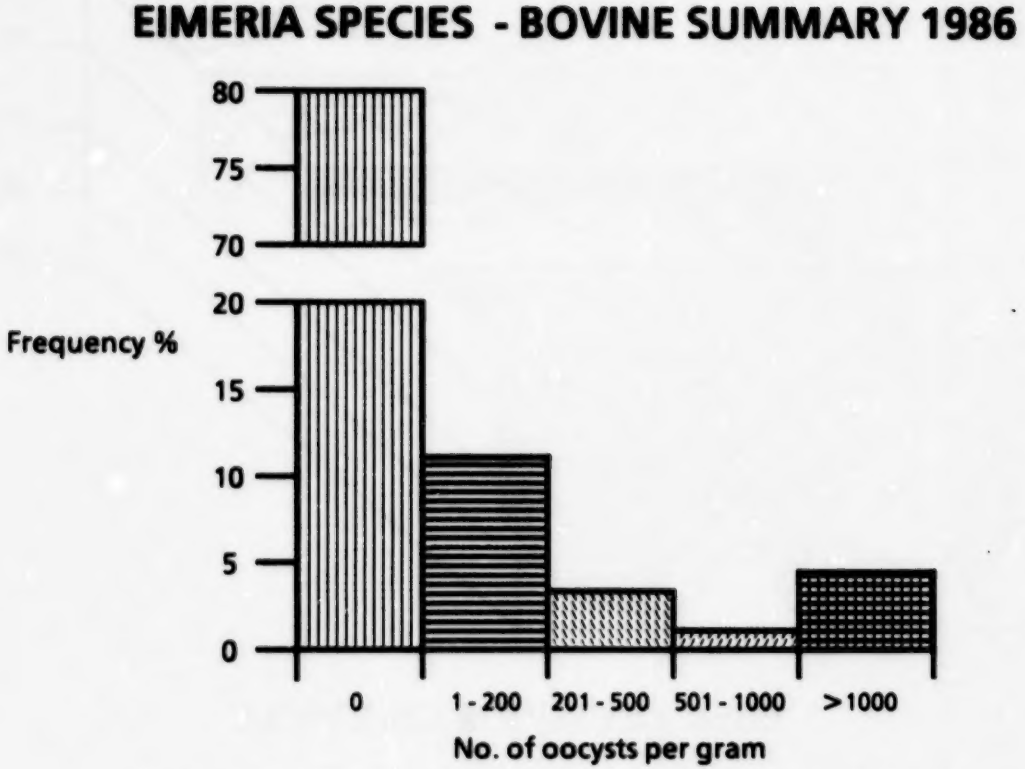

Figure 2. The number of cases of coccidia reported in 1986. Tabulated by oocysts per gram of feces

SALMONELLA TABLE 1976 - 1986

POULTRY PARATYPHOID ISOLATES

Salmonella isolations from poultry submissions and environmental samples including Edmonton, Lethbridge Fairview and Airdrie

TYPING	'76	'77	'78	'79	'80	'81	'82	'83	'84	'85'	'86'
S. agona				2	18	4	2	4	7	4	5
S. albany				23	42	2	3		1	2	2
S. anatum				1		1			1	3	3
S. arizona				1	14	5	11	9	11	22	11
S. bandaka						2					
S. bareilly			2	6							
S. blockley			1	1							
S. bredoney										2	
S. california	1	1		4	46	8	18	3			
S. carrau						4					
S. cerro		5	1	2	15	9				1	
S. derby						1					
S. eimsbuettel					24	1					
S. enteritidis				1	1	2	3	7	4	1	1
S. hadar					1						13
S. haardt		1	2	24	4	3	1	2			1
S. havana					1	5					
S. heidelberg	3	16		21	15	5	1	9	5	3	4
S. indiana	2	2									
S. infantis	13	6	10	52	118	47	25	21	9	10	4
S. java					4						
S. johannesburg	2										
S. kentucky				1		13	16				
S. kottbus	2	1									
S. krusei				1							
S. landau				1							
S. lille					1						
S. litchfield				1	1	13	4	2			1
S. livingstone											1
S. manhattan	1	1							3		
S. mbandaka											1
S. meleagridis											1
S. minnesota			1								
S. molade						3					
S. montevideo	1	2		5	33	1	5	3	2	2	1

SALMONELLA TABLE CONTINUED

TYPING	'76	'77	'78	'79	'80	'81	'82	'83	'84	'85	'86'
S. muenster						1					
S. nienstedten		5	3	18	26	31	5	8	7	9	8
S. newington	1	3			2						
S. newport	1		1	7						2	1
S. ohio	4				3				1		
S. oranienburg			3	4			2			1	
S. rubislaw							1	1			
S. saint paul	2		1	43	11	15	5	6			2
S. schwarzengrund				6	2	9	6	6		3	
S. senftenberg							2	2		1	
S. singapore				1		5					
S. species						1		1			
S. tennessee	1	1		11		1					
S. thompson	1	4	1	3	13	8	1				2
S. typhimurium	8	10	36	39	68	8	35	31	28	13	9
S. untyped									17	3	16
S. urbana					1						
S. verchow					1						
S. worthington							1				
S. OR:eh:-											1
S. OR:K:1,5											1
subgenus r1:12									1		
	46	55	64	289	460	201	146	116	97	82	89

POULTRY HEALTH PROGRAM

	REPLACEMENT SAMPLES	BROODING SAMPLES	LAYING SAMPLES	1ST HATCH SAMPLES	TOTAL
TOTAL					
No. of Submissions	98		135	91	324
No. of positives (+)	0		40	0	42
% positive					
1986	0.0		29.6	0.0	13.0
1985	2.8		26.3	4.0	11.6
1984	10.1		24.8	7.4	14.5
1983	6.2		20.0	2.4	10.0
* 1978	15.8		27.8	0.8	21.1

* start of program

SUMMARY OF SALMONELLA SEROTYPES

REPLACEMENT SAMPLES	LAYING SAMPLES	1ST HATCH SAMPLES
		S. anatum (2)
	S. agona (4)	
	S. haardt	
	S. hadar (5)	
	S. heidelberg (3)	
	S. infantis (4)	
	S. litchfield	
	S. newport	
	S. nienstedten (6)	
	S. montevideo	
	S. thompson	
	S. (not typed 13)	

NEOPLASMS

(Lethbridge, Fairview and Airdrie included)

	BOVINE	OVINE	EQUINE	CANINE
Adenocarcinoma	7	0	0	3
Mammary Gland	0	0	0	12
Parotid Gland	1	0	0	0
Perianal Gland	0	0	0	1
Skin	0	0	0	1
Thyroid Gland	0	0	0	1
Adenoma	3	0	1	6
Adrenal Gland	0	0	0	1
Mammary Gland	0	0	0	7
Papillary	0	0	0	1
Parathyroid Gland	0	0	0	1
Perianal Gland	0	0	0	13
Salivary Gland	1	0	0	0
Sebaceous Gland	0	0	0	11
Skin	0	0	0	2
Basal Cell Tumor	0	0	0	5
Carcinoma	1	2	0	23
Squamous	27	0	2	0
Undifferentiated	1	1	0	0
Chondroma	0	0	0	2
Epithelioma	0	0	1	3
Epulis	0	0	0	10
Fibroma	7	0	10	14
Fibropapilloma	2	0	0	0
Fibrosarcoma	2	1	0	6
Granulosa Cell Tumor	0	0	2	0
Hemangioma	3	0	0	7
Hemangiopericytoma	0	0	0	11

NEOPLASMS

(Lethbridge, Fairview and Airdrie included)

	BOVINE	OVINE	EQUINE	CANINE
Hemangiosarcoma	0	0	0	14
Histiocytoma	0	0	0	7
Keratocarthoma	0	0	0	2
Leiomyoma	0	0	0	4
Leiomyosarcoma	0	0	0	1
Lipoma	2	0	3	9
Liposarcoma	0	0	0	1
Lymphoma	5	0	1	4
Lymphosarcoma	20	0	3	5
Mastocytoma	0	0	0	4
Mast cell tumor	0	0	0	13
Melanoma	7	0	7	8
Metastatic Tumor	0	0	0	2
Mixed Mammary Tumor	0	0	0	11
Mixed Tumor	0	0	0	1
Neurofibroma	3	0	0	0
Osteosarcoma	1	0	0	6
Other	3	0	1	3
Papilloma	9	0	2	5
Pheochromocytoma	1	0	0	0
Polyp	0	0	0	2
Rhabdomyosarcoma	0	0	0	1

NEOPLASMS

(Lethbridge, Fairview and Airdrie included)

	BOVINE	OVINE	EQUINE	CANINE
Sarcoid	0	0	48	0
Sarcoma	2	0	0	4
Schwannoma	1	0	0	0
Seminoma	1	0	0	2
Sertoli Cell Tumor	0	0	0	1
Trichoepithelioma	0	0	0	3
TOTAL	118	4	83	255

NEOPLASMS

(Lethbridge, Fairview and Airdrie included)

LAB

	FELINE	ANIMALS CAPRINE		SWINE	OTHER
Adenocarcinoma	2	0	0	0	0
Mammary Gland	2	1	0	0	0
Pancreatic	1	0	0	0	0
Pancreatic	1	0	0	0	0
Skin	1	0	0	0	0
Thyroid	1	0	0	0	0
Basal Cell Tumor	3	0	0	0	0
Carcinoma	6	0	0	0	1
Squamous	5	0	0	0	0
Epithelioma	1	0	0	0	0
Fibroma	1	0	1	0	3
Fibrosarcoma	2	0	0	0	0
Granuloma	1	0	0	1	1
Hemangiocytoma	1	0	0	0	0
Hemangiosarcoma	0	0	0	0	1
Lipoma	1	0	0	0	0
Lymphoma	3	1	0	1	0
Lymphosarcoma	4	1	0	6	2
Mastocytoma	1	0	0	0	0
Mast cell tumor	9	0	0	0	0
Melanoma	2	0	0	2	0

NEOPLASMS

(Lethbridge, Fairview and Airdrie included)
LAB

	FELINE	ANIMALS CAPRINE	SWINE	OTHER
Nephroma	0	0	2	0
Neurofibroma	1	0	0	0
Osteosarcoma	1	0	0	0
Other	1	1	0	1
Papilloma	0	0	0	4
Pheochromocytoma	1	0	0	0
Polyp	1	0	0	0
Sarcoma	2	1	0	0
Trichoepithelioma	1	0	0	0
TOTAL	56	5	1	12	13